



## PHASE II LONG TERM CONTROL PLAN

### Appendix C Table of Contents

#### Appendix C

#### CSO Overflow Volumes and Occurrences Technical Memorandum

#### Table of Contents

December 2013 CSO Overflow Volumes and Occurrences Technical Memorandum

# PHASE II LONG TERM CONTROL PLAN

## Appendix C Table of Contents



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**City of Lancaster, Ohio  
Phase II Long Term Control Plan**

**CSO Overflow Volumes and Occurrences  
Technical Memorandum**

December 2013



**City of Lancaster, Ohio  
Phase II  
Long Term Control Plan**

**CSO Overflow Volumes and  
Occurrences  
Technical Memorandum**

Prepared for:  
City of Lancaster, Ohio

Prepared by:  
ARCADIS U.S., Inc.  
100 E. Campus View Blvd., Suite 200  
Columbus, OH 43235  
Tel 614 985 9100  
Fax 614 985 9170

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**Acronyms and Abbreviations**

- CSO - Combined Sewer Overflow
- FT – Feet
- HRS – Hours
- LTCP – Long Term Control Plan
- MG – Million Gallons
- NPDES – National Pollution Discharge Elimination System
- OEPA – Ohio Environmental Pollution Agency
- SWMM – Storm Water Management Model
- USEPA – United States Environmental Pollution Agency
- WPCF – Water Pollution Control Facility
- WTP – Water Treatment Plant
- WWTP – Waste Water Treatment Plant

## 1. Introduction

### 1.1 Background

As part of the Phase II LTCP analysis and as required by the City's NPDES permit Schedule of Compliance, the City of Lancaster (City) completed a comprehensive flow, rainfall, and stream gauge monitoring program. The City submitted the Flow Monitoring Technical Memorandum dated November 29, 2012 to OEPA as the required status report of the monitoring program. The City has since updated their Storm Water Management Model (SWMM) tool that was originally completed in 1999 to reflect 2012 Existing Conditions. The model was calibrated to the flow, depth and rainfall data collected in 2012 and discussed in the previously submitted Flow Monitoring Technical Memorandum. This report serves as the final evaluation of the CSO "2012 Existing Conditions" Overflow Volumes and Occurrences as required in the City's NPDES permit Schedule of Compliance item 1.b. The 2012 Existing Conditions reflect the collection system configuration during the flow monitoring that occurred in 2012 which is further discussed in Section 2.

### 1.2 Combined Sewer System Improvements

In the City's 1997 NPDES permit, the City identified thirty-one (31) CSO locations that discharged excess flow from the combined sewer collection system. The City's 1997 collection system is represented in Figure 1 – 1997 Collection System Schematic.

As of the 2012 flow monitoring period, the City had closed nineteen (19) of the thirty-one CSOs. From 1997 through 2012, the City has completed four major capital improvement projects to reduce and eliminate CSOs. In addition to capital improvement projects, the City has made various in-house improvements to CSO structures to reduce overflows. The in-house improvements have included increasing weir elevations, increasing the size of underflow openings, and increasing underflow pipe sizes. The City's expenditures for the completed improvements are summarized in Table 1 – CSO Reduction Costs.

**Table 1 CSO Reduction Costs**

Completion Date	CIP	Total Cost <sup>1</sup>
Varies	Various In-House Improvements	\$ 115,400
2011	Upper Hocking WPCF	\$ 50,093,100
2009	Lake/Allen Sewer Separation	\$ 8,933,100
2002	S. Broad St. Storm Sewer	\$ 1,819,900
2001	Downtown Improvements	\$ 4,980,600
<b>Total</b>		<b>\$ 65,942,100</b>

1. Total Costs include property acquisition, engineering, and construction administrative services.



## 2. Hydrology and Hydraulics

### 2.1 Introduction

In 1999, the City completed their first collection system model using XP-SWMM software as part of the City's Combined Sewer System Characterization Report. This 1999 XP-SWMM model was used as the tool for planning all the CSO reduction capital improvement projects in Table 1. As part of negotiations with OEPA for the June 1, 2007 Lawrence Street WPCF NPDES Permit, the City requested that the Permit Compliance Schedule include a model update to capture the collection system improvements that have occurred since 1999. With an updated collection system model that includes the completed improvements, the second phase of projects can be reevaluated to more accurately determine design requirements and to confirm that they are still required to meet existing regulatory requirements.

### 2.2 Flow Monitoring Program

As part of the City's Phase II LTCP, the City completed a comprehensive flow, rainfall, and stream gauge monitoring program to collect data for calibrating the updated model. The flow and rainfall monitoring program started on March 15, 2012 and ended on August 15, 2012. The flow monitoring program includes the following components:

- Flow monitoring at 40 locations throughout the collection system
- Rain gauging program utilizing four temporary rain gauges
- Stream gauge monitoring at one location along the Hocking River

#### 2.2.1 Flow Monitoring

In Table 3 Monitoring Locations, the flow meter number, location, and rationale for placement are provided. Figure 2 – Flow Monitoring Map shows the locations of the flow meters and the rain gauges that were utilized for data capture.

The program began with thirty (30) flow meters installed by Hydromax USA. An additional eight (8) flow meters were installed by the City in April 2, 2012 and Hydromax USA installed two (2) more on May 1, 2012. The flow meters shown bold in Table 2 were installed by the City. The flow meter numbers are not in numerical sequence, because they utilized the same flow meter location numbering system used in the original flow monitoring program.

Table 2 Monitoring Locations

Flow Meter ID	Location	Pipe Size	Rationale for Meter	Drivers
1	East side of Mary Burnham Park	10"	Capture flow downstream of CSO 1026	Located on downstream pipe as the outfall was not suitable for metering
2	NE corner of Mary Burnham Park	27"	Capture flow upstream of CSO 1026	Captures flow from sewershed 2
6	East Chestnut and South Cherry	56"	Capture flow downstream of CSO 1019	Captures flows from sewersheds 8a, 8b and 8c
7	South of railroad track near Mary Burnham Park	18"	Capture flow upstream of CSO 1019	Located on downstream pipe as the outfall was not suitable for metering
8	<b>East of East King and North Cherry</b>	<b>24"</b>	<b>Trunk sewer meter</b>	<b>Captures flow from sewershed 5b</b>
9	<b>Behind Kroger</b>	<b>24"</b>	<b>Trunk sewer meter</b>	<b>Captures flow from sewershed 7</b>
10	West of Fetters Run and East 6th	48"	Capture flow downstream of CSO 1029	Captures flow from sewershed 5a
11	West of Fetters Run and East 6th	48"	Capture flow upstream of CSO 1029	Located on the outfall pipe
14	<b>Brooks and East Chestnut</b>	<b>36"</b>	<b>Trunk sewer meter</b>	<b>Captures flow from sewersheds 6 and 14</b>
15	<b>Fulkerson and CSX RR</b>	<b>30"</b>	<b>Trunk sewer meter</b>	<b>Captures flow from sewershed 1</b>
16	Lawrence and Wheat	18"	Trunk sewer meter	Captures limited flow from old sewershed 11
19	West Walnut East of the Hocking River	27"	Capture flow downstream of CSO 1027	Located on the outfall pipe
20	West Walnut West of Memorial	27"	Capture flow upstream of CSO 1027	Captures flow from sewershed 15
21	South of Union and Memorial	14"	Capture flow downstream of CSO 1011	Located on downstream pipe as the outfall was not suitable for metering
22	East of Columbus and Union	27"	Capture flow upstream of CSO 1011	Captures flow from sewershed 20
23	Miller Park and West 5th	15"	Capture flow downstream of CSO 1012	Located on downstream pipe as the outfall was not suitable for metering
24	West 5th and Memorial	36"	Capture flow upstream of CSO 1012	Captures flow from sewershed 22
25	West 6th and Memorial	24"	Capture flow downstream of CSO 1013	Located on downstream pipe as the outfall was not suitable for metering
26	West 6th and Memorial	11.25"	Capture flow upstream of CSO 1013	Captures flow from sewershed 23
27	South Broad and Memorial	24"	Trunk sewer meter	Captures flow from sewersheds 12a and 12b
28	North of Lewis in Maher Park	30"	Trunk sewer meter	Captures flow from sewersheds 13 and 32
31	East of High and Canal	36"	Interceptor meter	Captures flow from sewershed 14
32	East of High and Canal	27"	Interceptor meter	Captures flow from sewersheds 14 and 18

Flow Meter ID	Location	Pipe Size	Rationale for Meter	Drivers
33	<b>West Fair and Hocking River</b>	36"	Trunk sewer meter	<b>Captures flow from sewershed 27</b>
34	West Allen and Memorial	18"	Capture flow downstream of CSO 1014	Captures flow from sewershed 24
35	Influent to YMCA Pump Station	12"	Capture flow upstream of CSO 1014	Located on downstream pipe as the outfall was not suitable for metering
37	West of Memorial and Park St	10"	Capture flow downstream of CSO 1033	Located on downstream pipe as the outfall was not suitable for metering
38	West of Memorial and Park St	30"	Capture flow upstream of CSO 1033	Captures flow from sewershed 26
39	In alley North of West Main and Thomas	36"	Trunk sewer meter	Captures flow from sewershed 17
40	North of West Wheeling and Hocking River	18"	Trunk sewer meter	Captures flow from sewersheds 21a and 21b
42	East end of Carpenter	12"	Trunk sewer meter	Captures flow from sewershed 10
43	<b>East of Slocum and 8th</b>	10"	<b>Trunk sewer meter</b>	<b>Captures flow from sewershed 25</b>
50	<b>Della and East Locust</b>	15"	<b>Trunk sewer meter</b>	<b>Captures flow from sewershed 2</b>
76	West of Whiley and Lincoln	24"	Capture flow upstream of CSO 1008	Captures flow from sewershed 16
77	West of Whiley and Lincoln	24"	Capture flow downstream of CSO 1008	Located on the outfall pipe
101	<b>Plaza Way and Hocking River</b>	30"	<b>Trunk sewer meter</b>	<b>Captures flow from sewersheds 28, 29, 30 and 31</b>
102	West of Memorial and West Mulberry	21"	Capture flow upstream of CSO 1009	Captures flow from sewershed 19
103	Memorial and West Mulberry	24"	Capture flow downstream of CSO 1009	Located on the outfall pipe
104	South of Lawrence and South Maple	18"	Trunk sewer meter	Captures flow from sewersheds 8d, 8e and 11
105	West Influent to WPCF	48"	Interceptor meter	Captures influent flow to the WPCF
106	East Influent to WPCF	48"	Interceptor meter	Captures influent flow to the WPCF

### 2.2.2 Rainfall Monitoring

Thirty (30) rainfall events were collected during the monitoring period from four temporary rain gauges and one permanent rain gauge. The four temporary rain gauges were located at the Lancaster Lawrence Street WPCF, the Division of Water Miller Park WTP, the Whiley Avenue Stormwater Pump Station, and the Upper Hocking Pump Station at Pierce Avenue, as shown in Figure 2. The permanent rain gauge is located at the Fairfield County Airport (National Weather Station observation site KHLQ).

A technical memorandum was developed to document the data and procedures used to develop the "Typical Year". Development of a typical year rainfall hyetograph provides a platform upon which to evaluate the system characterization and develop alternatives for the City of Lancaster's collection systems under the Phase II LTCP effort. Evaluating historical rainfall data, understanding the annual patterns and assembling a typical year is a location specific process. The Typical Year memorandum details the approach and assumptions used in the development of Lancaster's typical year. A copy of the Typical Year Memorandum is included in this memorandum as Appendix A.

### 2.3 Combined Sewer System Model SWMM

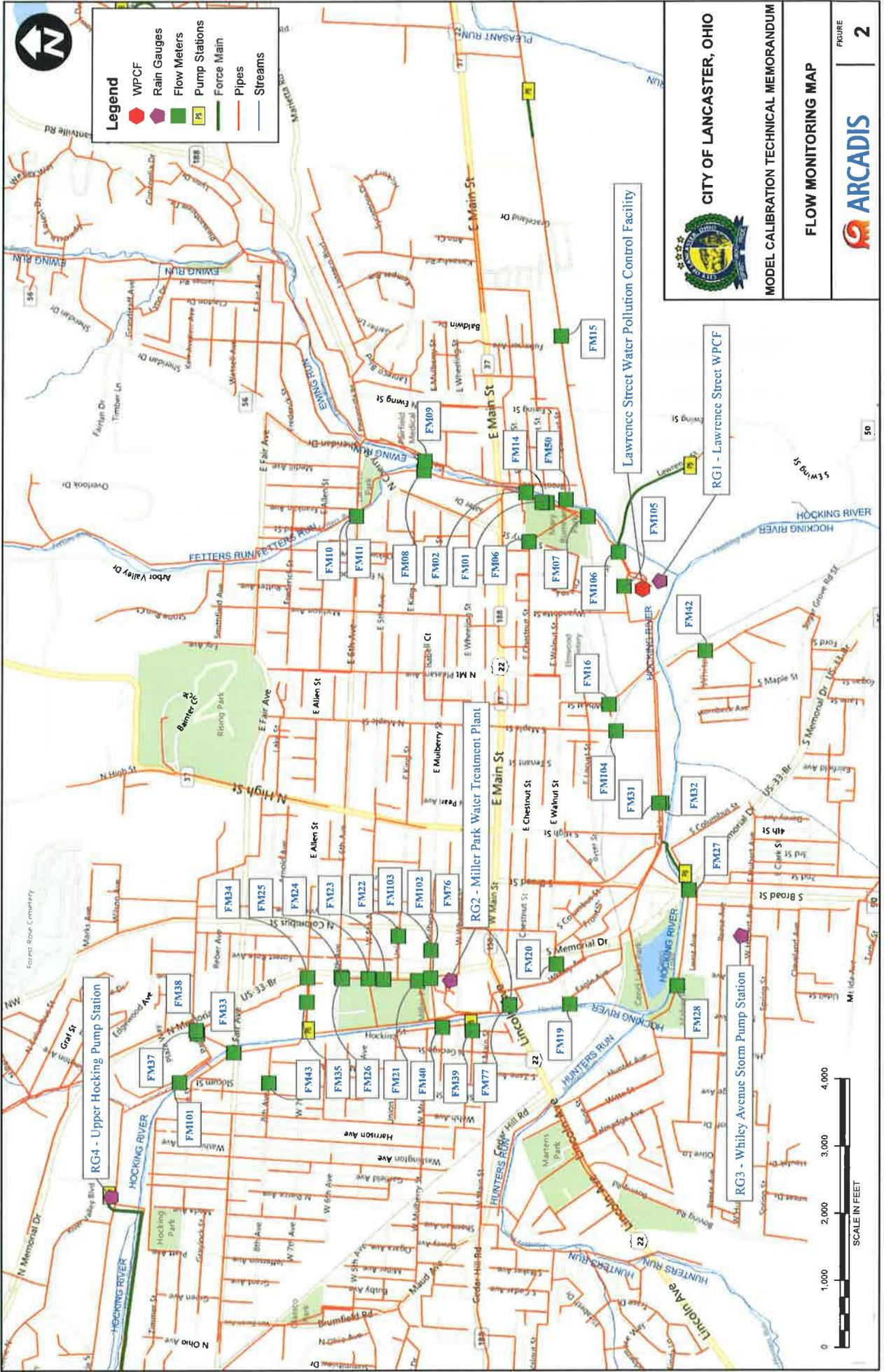
The model update was completed to represent the existing collection system conditions that will be used to evaluate, confirm, and further develop capital improvement projects to meet regulatory requirements and the City's NPDES Permit Schedule of Compliance item 1.b. and item 4.a.

To complete the model update, the existing XP-SWMM model was migrated to a more robust software platform, PCSWMM, and was built and calibrated to accomplish the following:

- Incorporate all collection system improvements since the last model update including the Lake Allen Maple Sewer Improvement project completed in 2008 and the Upper Hocking WPCF completed in 2011. In addition, numerous CSOs that have been closed or modified as a result of the ongoing operation and maintenance improvements were updated in the model. As of the 2012 flow monitoring period, there were twelve CSOs. Subsequent to completion of the 2012 flow monitoring, three additional CSOs have been closed. A

summary of the evolution of CSO closures in Lancaster over the last 14 years is shown in Table 3.

- Understand the collection system's response to various wet weather events.
- Verify the active CSOs and understand the drivers that result in activations.
- Develop and evaluate alternatives to complete the Phase II LTCP update.



### 2.3.1 2012 Existing Conditions Model Results

The 2012 existing conditions CSO statistics were generated from the calibrated 2012 Existing Conditions Model by simulating Lancaster's Typical Year Rainfall distribution. The annual CSO activations and annual volume are provided in Table 3 – Typical Year CSO Statistics (1999 and 2012). To verify collection system improvements, the typical year CSO activations from 1999 are included as a comparison. The 1999 statistics were originally provided in the City's LTCP Addendum (2005).

In comparing the 2012 Existing Condition Model CSO statistics to the LTCP addendum 1999 CSO statistics, the data indicates that the City has reduced the typical year overflow volume by approximately 64% or by 75.4 MG to 42.2 mgd. The total number of typical year activations have been reduced by approximately 50% or by 461 activations to 467 activations.

In the LTCP Addendum (2005), the estimated 2025 CSO statistics with all of the LTCP Addendum projects being complete indicated that the typical year overflow volume should be reduced by 83% or 97.9 MG to 19.7 MG. The total number of overflow events per typical year should be reduced by 29% or by 270 activations to 658 activations.

In reviewing Table 3, it must be understood that several collection system elements for the 2012 Existing Conditions are different than the Projected 2025 conditions. These include the following:

- Flow equalization at the Lawrence Street Water Pollution Control Facility has not yet been constructed.
- The Broad Street Express Sewer has not yet been constructed.
- The Baldwin Run Express Sewer will not be constructed.
- 11 CSOs not scheduled for closure in the LTCP Addendum were closed at the time of 2012 Existing Conditions.

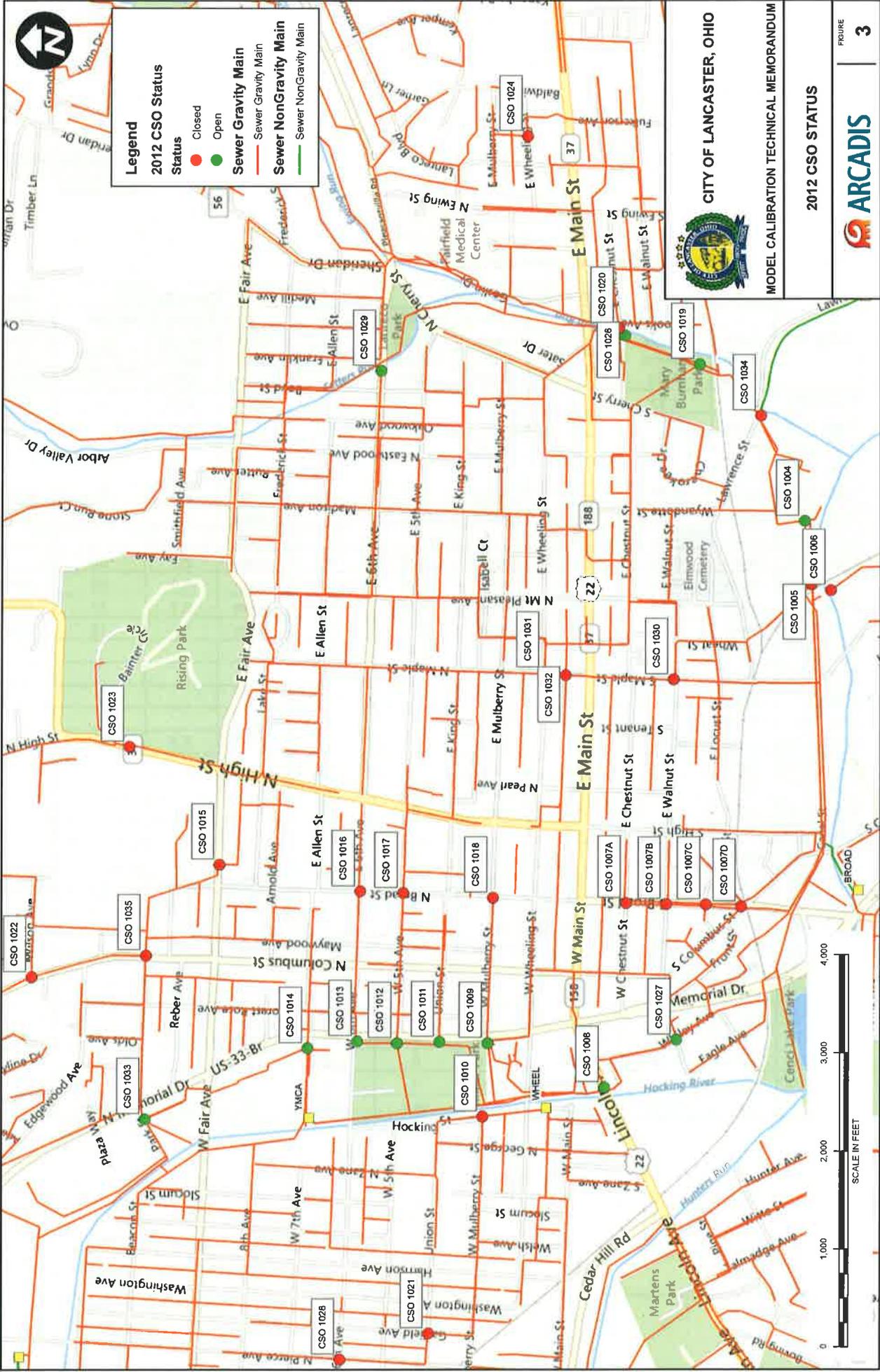
In reviewing Table 3, it can be seen that the number of annual activations is significantly less for 2012 Existing Conditions than for the Projected 2025 Conditions. The total annual CSO volume has been significantly reduced from 1999 Conditions, but is currently above the Projected 2025 Conditions primarily due to the collection system elements listed above.

The Table 3 data also indicates that for some of the remaining CSOs, there is an increase in number of events and volume. The increases are due to the closing of CSOs upstream of the CSOs with the increases. To better understand the impacts to the remaining CSOs, an overview of the collection system with the CSO locations is shown in Figure 3 2012 CSO Status.



Table 3 Typical Year CSO Statistics (1999 and 2012)

CSO No.	LTCP Addendum (2005)						Phase II LTCP			Dec 2013
	1999 Conditions			Projected 2025 Conditions			2012 Existing Conditions			
	CSO Open Status	Annual Volume (MG)	Annual Activations	CSO Open Status	Annual Volume (MG)	Annual Activations	CSO Open Status	Annual Volume (MG)	Annual Activations	CSO Open Status
CSO 1004	open	8.53	8	open	0.0	<3	open	8.8	9	open
CSO 1005	open	20.77	82		0	0				
CSO 1006	open	2.89	8	open	0	<3				
CSO 1007	open	0	0		0	0				
CSO 1008	open	2.77	8	open	0.01	8	open	2.2	29	open
CSO 1009	open	0.04	8	open	0.05	8	open	2.2	77	open
CSO 1010	open	-0.1	0		0	0				
CSO 1011	open	0.06	82	open	0.05	82	open	2.3	56	
CSO 1012	open	3.99	20	open	3.86	20	open	5.0	58	open
CSO 1013	open	0.33	82	open	0.34	82	open	5.1	77	open
CSO 1014	open	0.01	20	open	0.01	20	open	1.9	18	open
CSO 1015	open	0.56	20	open	0.63	20				
CSO 1016	open	0.99	82	open	1	82				
CSO 1017	open	0	<3	open	0	<3				
CSO 1018	open	0	<3	open	0	<3				
CSO 1019	open	55.93	82	open	0	<3	open	5.9	27	open
CSO 1020	open	0	0		0	0				
CSO 1021	open	0.03	8	open	0.03	8				
CSO 1022	open	0	<3	open	0	<3				
CSO 1023	open	0	<3		0	0				
CSO 1024	open	0	<3	open	0	<3				
CSO 1026	open	3.14	82	open	3.26	82	open	3.8	55	
CSO 1027	open	1.76	82	open	0.27	82	open	0.6	20	
CSO 1028	open	0	<3	open	0	<3				
CSO 1029	open	7.06	82	open	7.33	82	open	3.6	30	open
CSO 1030	open	0	0		0	0				
CSO 1031	open	5.3	82		0	0				
CSO 1032	open	0	0		0	0				
CSO 1033	open	2.83	82	open	2.83	82	open	0.8	5	open
CSO 1034	open	0.75	8	open	0	<3				
CSO 1035	open	0	<3	open	0	<3				
<b>Total</b>	<b>31</b>	<b>117.6</b>	<b>928</b>	<b>23</b>	<b>19.7</b>	<b>658</b>	<b>12</b>	<b>42.2</b>	<b>461</b>	<b>9</b>



**Legend**

**2012 CSO Status**

● Closed  
● Open

**Sewer Gravity Main**  
— Sewer Gravity Main

**Sewer NonGravity Main**  
— Sewer NonGravity Main

**CITY OF LANCASTER, OHIO**



**MODEL CALIBRATION TECHNICAL MEMORANDUM**

**2012 CSO STATUS**

**ARCADIS**

FIGURE **3**

### **3. Next Steps**

Utilizing the 2012 Existing Conditions Model, the City is evaluating and refining future LTCP projects to develop the most efficient means for meeting existing regulatory requirements. The evaluation of alternatives and selected projects will be provided in the Phase II LTCP that is required to be submitted to OEPA by September 1, 2014 per the October 24, 2013 letter from Ohio EPA to the City of Lancaster that granted the City an extension of six months.



## **Appendix A**

Development of a Typical Year  
December 6, 2012



Imagine the result

**City of Lancaster**

**Phase II Long-Term Control  
Plan**

**Development of a Typical Year**

July 9, 2013

Revised December 6, 2013



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Tom Bulcher, P.E.  
Project Manager

---

Laura McGinnis, P.E.  
Task Leader

---

Krishna Chelupati  
Engineer

**City of Lancaster  
Phase II LTCP**

Development of a Typical Year

Prepared for:  
City of Lancaster

Prepared by:  
ARCADIS U.S., Inc.  
100 E Campus View Blvd  
Suite 200  
Columbus  
Ohio 43235-1447  
Tel 614 985 9100  
Fax 614 985 9170

Our Ref.:  
00491066.0000

Date:  
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A Historic Rainfall Classifications

B December 6, 2013 Response Letter to OEPA on the Typical Year

**Acronyms and Abbreviation**

Combined Sewer Overflow - CSO

Federal Emergency Management Agency – FEMA

Long Term Control Plan - LTCP

National Climate Data Center - NCDC

National Weather Service - NWS

## Section 1 Executive Summary

Development of a typical year rainfall hyetograph provides a platform upon which to evaluate the system characterization and develop alternatives for the City of Lancaster's collection systems under the Phase II Long Term Control Plan (LTCP) effort. Evaluating historical rainfall data, understanding the annual patterns and assembling a typical year is a location specific process. This memorandum details the approach and assumptions used in the development of Lancaster's typical year.

The goals of developing a typical year are to understand, based on historical data, the average annual volume, the average annual number of rainfall events and the average return period distributions that occur. Then, a representative, annual hyetograph for use in the Phase II LTCP effort is compiled. In Lancaster, the influence of the Hocking River and Baldwin Run river stages on the ability of the outfall flaggates to operate at several of the combined sewer overflow (CSO) play a role in the resulting CSO volumes. Building and applying a corresponding annual river stage dataset is necessary to represent the boundary conditions at the applicable CSOs (CSO 1008, 1014, 1019 and 1026) during the long-term simulations.

Based on the historical data from January 1966 through February 2012, the average annual rainfall in Lancaster is 36.7 inches with 79 wet weather events. Although several years closely matched the statistical averages, no single year contained enough average months to be used as the starting point. Rather, months from various years were compiled to create a typical year that represents an average year of rainfall in terms of rainfall volume, number of events and distribution of return periods. The resulting typical year is as shown in Table 1.

Return periods for the significant events (2-month and greater return periods) are listed in the table. The remaining events in any given month were classified as having a return period of less than 2-months. For example, there were five events in September 1999, and one of those events was a 9-month return period.

On August 12, 2013, a meeting was held at Ohio EPA to review this memo. Ohio EPA had several comments that were addressed by a December 6, 2013 response letter. A copy of the response letter is attached as Appendix B.



**Table 1 Summary of Typical Year Statistics**

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Volume (in)	3.0	2.0	2.6	3.4	3.9	3.4	4.1	3.8	3.1	2.2	3.0	2.3	36.8
# of Events	6	7	5	9	7	8	8	7	5	6	7	5	80
Return Periods for Significant Events in Each Month			5- month	6- month	4- month	1- year	2- year	3- month, 2- month, 2- month	9- month	3- month			
Year Used	2006	1995	2006	1994	2009	1971	2002	2006	1999	2010	1994	1996	

**Section 2 Historical Data**

To understand what is “typical”, enough historical rainfall data must be available. As the National Weather Service (NWS) has been collecting data across the country for several decades, a large data set is often available to aid in this analysis.

**Section 2.01 Rainfall Data**

The National Climate Data Center (NCDC) maintains an inventory of historical hourly climate data for NWS rain gauges across the county. The NWS rain gauge in Lancaster (ID 334403) is located at the Water Treatment Facility and contains hourly data from 1966 with some data gaps. The NCDC data was processed to generate a summary of the precipitation data to classify each event. The data was further processed to create summaries of the events, the monthly volumes and the annual volumes, which were the basis of the analysis.



## Section 2.02 River Stage Data

During the flow monitoring period a river stage gauge was placed on the Hocking River in Lancaster. For the model calibration effort, the river stage data was extrapolated to each applicable CSO using the Federal Emergency Management Agency (FEMA) Flood Insurance profiles. In order to develop the typical “river” year, the river stage response for events during the monitoring period were compiled to build the typical “river” year rainfall. This river year will be used as a boundary condition at the CSO points during the long-term simulations. The locations of the NWS rain gauge and the temporary stream gauge are shown in Figure 1.

## Section 3 Analysis

Analyzing the historical rainfall data to identify what is “typical” is a three-step process as follows:

1. Calculate the average monthly and average annual rainfall volumes; identify “average” months and years in terms of rainfall volume
2. Calculate the average monthly and average annual number of events; identify “average” months and years in terms of number of events
3. Determine a typical distribution of rainfall event return periods per year.

### Section 3.01 Average Rainfall Volumes

First, the average rainfall volumes for each month were calculated using the historical data from January 1966 through February 2012. Months with missing rainfall totals were excluded from the calculation. Months falling within approximately 0.50 inches of the average rainfall volume were identified as typical. Over the 47 years of historical data, 107 months were identified as typical.

Then the average annual rainfall volume was calculated for the entire historical period, with years missing any month of data excluded from the calculation. Years with total rainfall volumes within 2 inches of the average total rainfall volume were identified as typical. Seven years were highlighted as typical. Five years were identified as having significant data gaps and were excluded from future annual calculations.

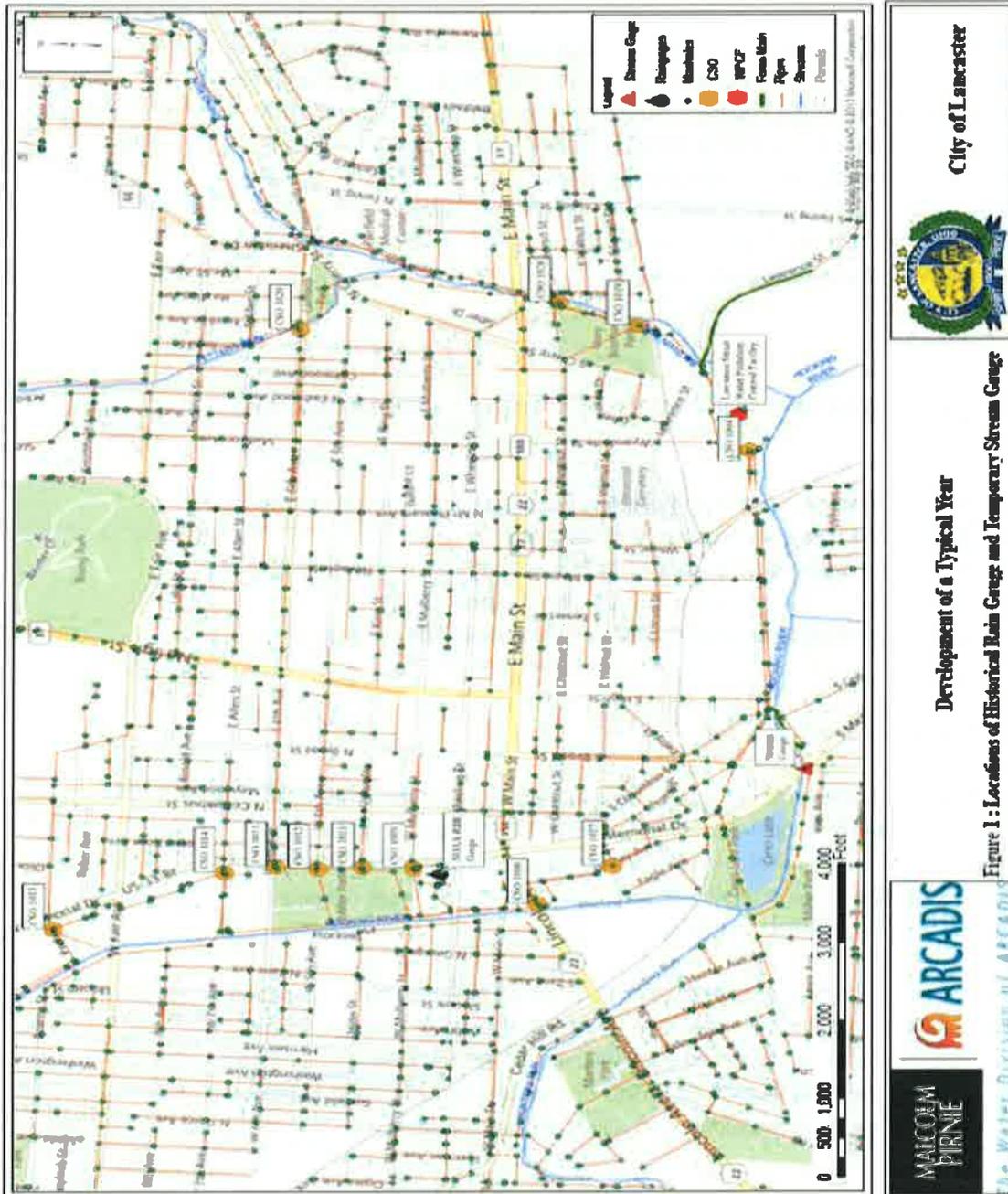


Figure 1 Location of Historic Rain Gauge and Temporary Stream Gauge



Table 2 presents the historical data set, with the typical months and years highlighted in green.

**Table 2 Summary of Historical Monthly Rainfall Totals**

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	(in.)												
1966	3.9	3.0	0.8	4.2	2.3	0.9	6.8	1.6	3.5	0.6	4.2	2.8	34.4
1967	0.8	1.6	6.1	2.8	5.2	2.2	3.6	2.2	4.1	1.1	3.2	3.0	35.8
1968	2.4	0.4	4.3	2.4	10.9	3.5	2.1	2.8		1.0	3.2	3.4	36.5
1969	3.0	1.3	1.5	3.0	1.6	4.4	2.1	2.4	0.4	2.1	2.9	2.6	27.4
1970	1.3	1.8	3.1	6.6	3.5	3.7	2.5	4.0	4.7	2.5	2.5	2.9	39.0
1971	1.7	4.4	2.7	0.7	3.4	3.4	2.3	3.7	2.0	1.1	1.7	3.3	30.4
1972	1.8	1.7	3.1	6.0	3.6		2.2	3.7	3.4	2.9	5.3	3.5	37.2
1973	2.4	1.3	3.0	5.5	3.8	6.9		8.9	2.1	4.8	4.1		42.8
1974			2.5	3.5	5.3	4.5	2.1	6.1	3.5	0.9	2.8	3.2	34.4
1975	2.5	4.5		3.0	2.7	3.5	3.3	5.4	6.0	4.2	1.7	3.3	40.1
1976	2.4	3.0	2.2	1.2	2.5	4.8	7.2	4.7	1.6	3.0	0.2	0.9	33.7
1977	1.1	0.4	3.5	2.9	2.1	4.0	2.6	3.7	3.0	4.0		3.0	30.3
1978	5.2	0.6	3.1	3.8	5.5	2.9	2.6	5.4	1.0	4.6	1.9	5.5	42.1
1979	3.6	4.1	1.1	3.8	4.3	1.8	5.3	9.5	6.6	1.4	2.8	1.7	46.0
1980	1.8	1.5	4.1	2.4	4.1	4.2	8.9	8.4	2.0	1.6	2.2	1.6	42.8
1981		4.0	2.0	5.0	6.5	9.0	1.8	0.9	2.0	1.3	2.6	2.4	37.5
1982	4.6	1.6	4.3	1.6	3.0	2.5	1.2			1.4			20.2
1983	1.2	1.4	1.0	5.5	7.1	4.2	4.1	1.3	2.0	5.0	4.1	3.3	40.2
1984	1.1	2.6	0.7	2.8	4.5	1.1	1.9	0.2	3.0	2.9	3.3	3.2	27.3
1985	0.8	2.3	5.5		2.3	1.9	8.3		0.8	2.3	9.9		34.1
1986	1.5			1.4	2.0	3.8	3.4	1.8	0.9	5.3	1.4	3.3	24.8
1987	0.2	0.9	1.5	3.8	1.5	2.1	2.3	1.3	1.8	1.6	1.2	1.7	19.9
1988	3.6	4.1		0.9	1.8	1.2				0.7	3.6	2.2	18.1
1989	2.1	3.9	5.3	5.7	7.1	5.5	4.5	6.0	3.1	2.8	1.6	2.2	49.8
1990	2.2	3.1			8.7	4.3	6.3	3.0	2.9	3.6	1.5	6.9	42.5
1991			4.9	4.3	0.7	1.9	4.0		1.5	1.0	0.8	3.3	22.4
1992	0.9	0.7	2.7		3.5	2.1		3.8	1.7	0.3	1.9		17.6
1993			2.3			0.5	4.5	0.5	3.0	2.4	4.1	0.9	18.2
1994	3.5	1.9	2.7	3.4	2.6	5.5	5.3	2.1	2.0	0.7	2.4	2.1	34.2
1995	4.2	2.0	1.0	1.4	8.3	4.3	3.6	3.2	0.9	3.0	1.8	2.9	36.6
1996	4.3	1.5	2.8	3.6	7.3	4.5	5.5	0.7	3.1	1.6	3.4	2.3	40.6

**Table 2 Summary of Historical Monthly Rainfall Totals**

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1997	1.7	1.0	4.3		2.2	2.4	5.3	6.8	2.1	2.1	3.3	2.0	33.2
1998	3.0	2.9	2.1		1.8	6.4	1.7	2.3	2.9	5.4	1.9	2.0	32.4
1999	4.8	3.2	2.2	3.3	2.1	0.2	2.1	3.7	3.1	1.6	1.0	2.2	29.5
2000	3.7	3.7	3.0	1.4	3.0	2.8	2.1	2.3	2.6	0.8	0.9	4.1	30.4
2001	1.4	0.7	1.8	4.3	4.2	1.4	3.5	4.8	1.4	4.2	3.1	2.0	32.8
2002	2.2	1.2	3.1		2.6	3.2	2.3	2.3		4.6	2.3		23.8
2003	0.1	3.1	2.1	1.9	4.8	2.6	4.5	1.5	5.3	1.6	0.3	2.9	30.7
2004				3.4	1.3	5.0	7.6		1.9	3.8	4.2	3.7	30.9
2005	8.0	1.1	3.2	4.1	2.6	0.5	1.4	6.2	3.0	3.9	3.6	1.6	39.2
2006	3.0	1.1	2.6	3.0	3.1	6.2	4.8	3.8	5.9	1.8			35.3
2007	4.1		4.7	2.8	0.9	3.1	6.1						21.7
2008				2.0	5.5	5.2		2.6	0.9	1.2			17.4
2009					2.6	2.8							5.4
2010				1.8	5.4	5.6	3.9	5.7	1.1	1.6	4.7	1.3	31.1
2011	1.6	4.7	4.5	1.5	6.3	4.8	7.2	3.1	3.6	3.9	5.2	4.2	50.6
2012	3.8	1.4											5.2
Average	2.6	2.2	2.9	3.2	3.9	3.5	4.0	3.7	2.7	2.5	2.8	2.8	36.7

**Section 3.02 Average Number of Rainfall Events**

The second phase identified typical months and years based on the average number of events per month and year. The following criteria were used to define a wet weather event:

- Minimum 0.10 inches of rainfall within a 12-hour period
- Minimum inter-event time of 12 hours

Starting with the months again, the average number of events per month was calculated. Months with missing data were excluded from the calculation. Months with the number of events falling within two events of the average were identified as typical. Over the 47 years of historical data, 269 months were identified as typical.

Then the average annual number of events was calculated for the entire historical period, with years missing any month of data excluded from the calculation. Years with

a total event count within four events of the average annual total were identified as typical. Nine years were highlighted as typical.

Table 3 presents the historical data set, with the typical months and years highlighted in green.

**Table 3 Summary of Historical Monthly Number of Events**

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1966	5	6	4	7	5	3	5	6	6	2	7	5	61
1967	3	5	6	6	8	3	6	3	3	6	6	8	63
1968	4	1	4	7	10	8	4	5		3	3	6	55
1969	3	4	3	8	2	8	4	2	3	3	5	6	51
1970	4	4	5	6	6	6	5	4	8	6	5	6	65
1971	4	9	8	5	9	8	8	5	7	5	7	7	82
1972	7	8	11	11	7		9	8	10	7	7	10	95
1973	7	6	12	8	13	10		5	6	8	7		82
1974			6	8	9	11	5	9	6	4	9	5	72
1975	10	8		8	9	8	10	10	8	6	9	7	93
1976	8	6	8	6	9	6	14	8	7	9	1	5	87
1977	4	4	8	7	6	7	12	8	2	5		1	64
1978	9	3	11	11	12	9	9	10	3	9	7	8	101
1979	10	10	6	9	11	5	9	11	5	7	9	5	97
1980	5	7	12	6	7	11	8	15	3	4	5	9	92
1981		9	6	11	9	8	7	5	6	4	4	8	77
1982	10	7	9	7	6	9	6			5			59
1983	5	5	7	14	10	10	7	6	5	9	10	8	96
1984	7	10	5	9	10	3	10	2	1	7	6	10	80
1985	5	7	7		8	2	10		4	7	13		63
1986	3			7	7	9	12	7	1	2	2	5	55
1987	1	3	3	7	2	6	7	4	3	7	7	7	57
1988	4	5		5	7	5				4	12	7	49
1989	8	4	6	11	15	13	10	9	5	10	7	8	106
1990	7	6			12	8	8	8	7	8	5	10	79
1991			14	8	3	5	5		8	7	6	4	60
1992	4	2	6		4	4		6	5	3	4		38
1993			4			4	10	4	5	6	6	3	42
1994	10	6	7	9	7	8	8	4	4	5	6	5	79
1995	6	7	2	5	9	9	9	4	6	7	8	7	79

**Table 3 Summary of Historical Monthly Number of Events**

Year	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1996	8	4	4	4	13	11	9	1	5	6	11	5	81
1997	5	4	8		5	5	9	13	4	7	5	5	70
1998	5	6	6		9	13	7	8	7	5	5	5	76
1999	9	13	3	11	4	2	7	5	5	4	5	4	72
2000	6	3	4	1	5	5	6	6	4	2	4	4	50
2001	4	2	6	3	7	4	4	10	6	5	9	4	64
2002	5	4	5		6	3	7	4		10	7		51
2003	1	9	8	4	13	7	6	4	5	4	1	9	71
2004				5	4	6	6		2	9	9	7	48
2005	11	7	7	6	8	2	8	8	6	9	5	7	84
2006	8	3	5	9	13	10	9	7	7	2			73
2007	8		8	8	4	11	8						47
2008				6	13	4		8	5	2			38
2009					7	4							11
2010				4	9	10	7	5	3	5	4	6	53
2011	6	6	11	2	15	13	9	7	9	9	7	10	104
2012	9	7											16
Average	6	6	7	7	8	7	8	7	5	6	6	6	79

**Section 3.03 Distribution of Return Periods**

Once the average volumes and number of events were determined, the distribution of rainfall return periods was evaluated to understand the magnitude of events Lancaster typically experiences. To do this, each defined rain event over the 47-year period was classified using Bulletin 71, Rainfall Frequency Atlas of the Midwest (Huff and Angel, 1992). Table 4 presents an example of the return periods identified in a small subset of the historic data. The full dataset can be found in Appendix A.

After compiling the return periods observed in the historical data, the average recurrence was calculated for several return periods. For example, the NWS rain gauge recorded 57 three-month events over the 42 years for an average of 1.4 three-month events per year. Table 5 shows the calculated average number of events per year in Lancaster for 12 key return periods.



**Table 4 Summary of Average Return Periods**

Event Date & Time	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
1/1/2011 5:00	10	0.60	0.20	<2-mo
1/8/2011 9:00	1	0.10	0.10	<2-mo
1/11/2011 17:00	1	0.10	0.10	<2-mo
1/15/2011 13:00	1	0.10	0.10	<2-mo
1/18/2011 17:00	5	0.20	0.10	<2-mo
1/24/2011 20:00	18	0.50	0.10	<2-mo
2/1/2011 7:00	21	1.00	0.20	<2-mo
2/5/2011 15:00	1	0.10	0.10	<2-mo
2/11/2011 14:00	1	0.10	0.10	<2-mo
2/20/2011 23:00	27	1.60	0.30	4.5-mo, 27-hr
2/24/2011 23:00	16	1.40	0.20	4-mo, 16-hr
2/28/2011 1:00	9	0.50	0.20	<2-mo
3/4/2011 13:00	2	0.20	0.10	<2-mo
3/5/2011 2:00	26	0.90	0.20	<2-mo
3/6/2011 15:00	1	0.10	0.10	<2-mo
3/9/2011 3:00	35	1.40	0.20	3-mo, 35-hr
3/11/2011 1:00	1	0.10	0.10	<2-mo
3/15/2011 19:00	2	0.20	0.10	<2-mo
3/21/2011 4:00	1	0.50	0.50	<2-mo
3/21/2011 18:00	14	0.80	0.20	<2-mo
3/24/2011 0:00	1	0.10	0.10	<2-mo
3/30/2011 17:00	1	0.10	0.10	<2-mo
3/31/2011 16:00	1	0.10	0.10	<2-mo
4/2/2011 13:00	1	0.10	0.10	<2-mo
4/4/2011 16:00	13	1.40	0.70	4-mo, 13-hr

**Table 5 Summary of Average Return Periods**

Return Period	2-mo	3-mo	4-mo	5-mo	6-mo	7-mo	8-mo	9-mo	10-mo	11-mo	1-yr	1+ yr
Average Number per Year	1.9	1.4	1.2	0.8	0.6	0.1	0.5	0.5	0.0	0.1	0.7	1.4

By determining the return period for every event, months with atypical return periods were flagged. This is necessary to avoid selecting an otherwise "average" month that contained an atypical return period. For example, a month that fits the first two criteria

(volume and number of events) may contain an event with a 10-year return period and therefore should not be included in the typical year.

#### **Section 4 Development**

With the identified average months and years selected, the process of building the typical year began. The last step in creating the typical year rainfall hyetograph was to review the historical data for each to determine if one specific year could be classified as typical. Using Table 2 and Table 3 only 1995 was typical in terms of annual rainfall volume and annual number of events. After further investigation, the distribution of rainfall return periods in 1995 was atypical, including four 4-month events and a 4-year event. Identifying an existing year as the typical year was ruled out.

The next approach was to review each month and compile a reasonable set of twelve months that matched the historic average in terms of annual rainfall volume, number of events and distribution of return periods. Using a combination of Table 2, Table 3 and Appendix A, typical months that contained with a 1 to 2-year return period event were identified. In reviewing those events, it was noted that events with this return period were more likely to occur in the summer months. The 2-year, 4-hour event on July 25, 2001 event was selected as a representative, intense summer storm. Although July 2001 was typical in terms of monthly rainfall volume, the number of events was less than typical. July 2001 also contained an 8-hour, 2-hour event. Looking at July 2002, the number of events was slightly below average and the total rainfall was less than average. By adding the July 25, 2001 event into the July 2002, the number of events and the rainfall volume both matched the typical values for July. Next, 1-year return periods were reviewed, and the 1-year, 9-hour event on June 26, 1971 was selected. June 1971 was typical in terms of both the number of events and the rainfall volume.

Moving on, the historical events were reviewed to find a 9-month, 6-month and 5-month events that fell in typical months. Intentionally, winter months were not considered to avoid requiring the H&H model to evaluate snowfall and snowmelt based on temperature. Instead, spring and fall months were preferentially identified. September 1999 contained a 9-month, 18-hour event and was typical in terms of both the number of events and the rainfall volume. April 1994 contained a 6-month, 17-hour event and was typical in terms of both the number of events and the rainfall volume. March 2006 contained a 5-month, 24-hour event and was typical in terms of both the number of events and the rainfall volume.



The smaller events within the typical year were then identified in the same manner to fill in the remaining months. In some months, small events were removed or added to better fit the total annual volume and distribution of return periods. For example, December 1996 was typical in terms of rainfall volume and number of events, but the annual total volume was too low. A small event (0.1 inches over 1 hour) was replaced with an event with a larger volume (0.7 inches over 28 hours) to increase the annual total. Note that both storms were classified as having a return period interval of less than 2-month so the distribution of significant events did not change. Insignificant events were also removed or replaced in January, May, October and November to improve the total annual volume.

As shown in Table 6 (a duplicate of Table 1) the resulting constructed typical year generated a total annual rainfall volume of 36.8 inches, consisted of 80 events and closely resembled the averages in terms of return periods.

**Table 6 Summary of Typical Year Statistics**

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Volume (in)	3.0	2.0	2.6	3.4	3.9	3.4	4.1	3.8	3.1	2.2	3.0	2.3	36.8
# of Events	6	7	5	9	7	8	8	7	5	6	7	5	80
Return Periods for Significant Events in Each Month			5-month	6-month	4-month	1-year	2-year	3-month, 2-month, 2-month	9-month	3-month			
Year Used	2006	1995	2006	1994	2009	1971	2002	2006	1999	2010	1994	1996	

Table 7 presents the entire collection of events contained in the constructed typical year including duration, volume, average intensity and peak hourly intensity. Table 7 also identifies events with significant return periods in blue.

Table 7 Summary of Constructed Typical Year

Event Number	Event Date	Duration (hrs)	Total Rain (in)	Average Intensity (in/hr)	Max Intensity (in/hr)	Return Period and Duration
1	January 1	9	0.8	0.09	0.2	
2	January 3	16	0.3	0.02	0.1	
3	January 11	2	0.2	0.10	0.1	
4	January 13	7	0.3	0.04	0.1	
5	January 17	12	0.7	0.06	0.2	
6	January 22	9	0.7	0.08	0.1	
7	February 3	1	0.1	0.10	0.1	
8	February 4	1	0.1	0.10	0.1	
9	February 10	1	0.1	0.10	0.1	
10	February 12	1	0.1	0.10	0.1	
11	February 15	16	0.8	0.05	0.1	
12	February 24	3	0.2	0.07	0.1	
13	February 27	15	0.6	0.04	0.1	
14	March 6	1	0.1	0.10	0.1	
15	March 8	4	0.3	0.08	0.1	
16	March 11	24	1.6	0.07	0.3	5-month, 24-hour
17	March 12	1	0.2	0.20	0.2	
18	March 13	9	0.4	0.04	0.2	
19	April 3	1	0.1	0.10	0.1	
20	April 6	5	0.4	0.08	0.1	
21	April 10	17	1.7	0.10	0.5	6-month, 17-hour
22	April 11	18	0.3	0.02	0.1	
23	April 13	10	0.3	0.03	0.1	
24	April 15	1	0.1	0.10	0.1	
25	April 28	1	0.1	0.10	0.1	
26	April 29	4	0.2	0.05	0.1	
27	April 30	9	0.2	0.02	0.1	
28	May 3	13	0.5	0.04	0.2	
29	May 6	4	1.1	0.28	0.3	4-month, 4-hour
30	May 13	2	0.3	0.15	0.2	
31	May 20	8	0.4	0.05	0.1	
32	May 26	1	0.5	0.50	0.5	
33	May 27	6	0.4	0.07	0.2	
34	May 31	8	0.7	0.09	0.3	
35	June 2	1	0.1	0.10	0.1	



Table 7 Summary of Constructed Typical Year

Event Number	Event Date	Duration (hrs)	Total Rain (in)	Average Intensity (in/hr)	Max Intensity (in/hr)	Return Period and Duration
36	June 5	1	0.1	0.10	0.1	
37	June 6	1	0.1	0.10	0.1	
38	June 13	1	0.4	0.40	0.4	
39	June 21	2	0.3	0.15	0.2	
40	June 21	1	0.4	0.40	0.4	
41	June 25	9	1.9	0.21	1.1	1-year, 9-hour
42	June 29	1	0.1	0.10	0.1	
43	July 9	13	1	0.08	0.4	
44	July 15	4	1.8	0.45	1.3	2-year, 4-hour
45	July 19	1	0.3	0.30	0.3	
46	July 20	1	0.1	0.10	0.1	
47	July 22	1	0.1	0.10	0.1	
48	July 23	3	0.2	0.07	0.1	
49	July 27	2	0.5	0.25	0.4	
50	July 29	1	0.1	0.10	0.1	
51	August 3	1	0.1	0.10	0.1	
52	August 7	1	0.2	0.20	0.2	
53	August 8	1	0.1	0.10	0.1	
54	August 14	3	0.8	0.27	0.7	2-month, 3-hour
55	August 18	8	1	0.13	0.9	2-month, 8-hour
56	August 27	17	0.3	0.02	0.1	
57	August 28	20	1.3	0.07	0.4	3-month, 20-hour
58	September 6	17	0.6	0.04	0.3	
59	September 20	10	0.2	0.02	0.1	
60	September 24	9	0.3	0.03	0.1	
61	September 27	1	0.1	0.10	0.1	
62	September 29	18	1.9	0.11	0.9	9-month, 18-hour
63	October 2	2	0.2	0.10	0.1	
64	October 5	1	0.1	0.10	0.1	
65	October 7	16	0.6	0.04	0.1	
66	October 15	3	0.2	0.07	0.1	
67	October 19	1	0.1	0.10	0.1	
68	October 26	5	1	0.20	0.4	3-month, 5-hour
69	November 1	1	0.1	0.10	0.1	
70	November 2	15	0.7	0.05	0.2	
71	November 6	1	0.1	0.10	0.1	



**Table 7 Summary of Constructed Typical Year**

<b>Event Number</b>	<b>Event Date</b>	<b>Durati on (hrs)</b>	<b>Total Rain (in)</b>	<b>Average Intensity (in/hr)</b>	<b>Max Intensity (in/hr)</b>	<b>Return Period and Duration</b>
72	November 8	1	0.1	0.10	0.1	
73	November 9	15	0.8	0.05	0.3	
74	November 16	17	0.6	0.04	0.1	
75	November 27	13	0.6	0.05	0.2	
76	December 4	28	0.7	0.03	0.1	
77	December 12	5	0.3	0.06	0.1	
78	December 16	13	1	0.08	0.2	
79	December 22	1	0.1	0.10	0.1	

## **Appendix A**

Historic Rainfall Classifications

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
1/1/1966 0:00	37	1.85	0.23	6-mo, 37-hr
1/3/1966 3:00	1	0.10	0.10	<2-mo
1/5/1966 20:00	15	0.88	0.10	<2-mo
1/22/1966 10:00	22	0.80	0.11	<2-mo
1/29/1966 14:00	13	0.20	0.03	<2-mo
2/1/1966 11:00	13	0.40	0.08	<2-mo
2/10/1966 9:00	9	0.15	0.03	<2-mo
2/12/1966 23:00	15	1.55	0.20	5.5-mo, 15-hr
2/16/1966 8:00	4	0.22	0.14	<2-mo
2/25/1966 16:00	7	0.10	0.05	<2-mo
2/28/1966 10:00	17	0.50	0.12	<2-mo
3/12/1966 10:00	14	0.15	0.04	<2-mo
3/18/1966 17:00	3	0.13	0.05	<2-mo
3/23/1966 15:00	4	0.27	0.10	<2-mo
3/29/1966 21:00	10	0.13	0.04	<2-mo
4/3/1966 14:00	10	0.35	0.06	<2-mo
4/6/1966 1:00	9	0.10	0.03	<2-mo
4/9/1966 0:00	5	0.28	0.13	<2-mo
4/11/1966 21:00	24	0.37	0.09	<2-mo
4/23/1966 8:00	44	0.74	0.10	<2-mo
4/26/1966 23:00	44	1.85	0.45	5.5-mo, 44-hr
4/30/1966 9:00	7	0.40	0.10	<2-mo
5/8/1966 3:00	4	0.24	0.10	<2-mo
5/9/1966 1:00	7	0.87	0.23	<2-mo
5/12/1966 2:00	20	0.56	0.14	<2-mo
5/18/1966 13:00	9	0.40	0.30	<2-mo
5/28/1966 17:00	1	0.15	0.15	<2-mo
6/6/1966 18:00	11	0.28	0.16	<2-mo
6/9/1966 23:00	7	0.35	0.30	<2-mo
6/13/1966 22:00	10	0.17	0.05	<2-mo
7/6/1966 19:00	2	0.43	0.33	<2-mo
7/9/1966 19:00	3	0.30	0.15	<2-mo
7/12/1966 1:00	23	4.36	1.55	25-yr, 23-hr
7/14/1966 14:00	8	1.23	0.53	4-mo, 8-hr
7/27/1966 22:00	12	0.32	0.10	<2-mo
8/2/1966 8:00	3	0.19	0.11	<2-mo
8/8/1966 16:00	3	0.10	0.05	<2-mo
8/9/1966 16:00	2	0.37	0.24	<2-mo
8/11/1966 3:00	14	0.44	0.32	<2-mo
8/14/1966 15:00	10	0.30	0.25	<2-mo
8/21/1966 19:00	2	0.15	0.10	<2-mo
9/4/1966 0:00	1	0.10	0.10	<2-mo
9/13/1966 17:00	3	0.15	0.10	<2-mo
9/19/1966 13:00	42	2.23	0.27	9-mo, 42-hr
9/25/1966 13:00	6	0.34	0.11	<2-mo
9/27/1966 5:00	9	0.10	0.04	<2-mo
9/30/1966 16:00	11	0.70	0.10	<2-mo
10/10/1966 2:00	4	0.15	0.10	<2-mo
10/15/1966 16:00	3	0.25	0.10	<2-mo
11/1/1966 7:00	1	0.45	0.45	<2-mo
11/2/1966 2:00	26	1.20	0.13	2-mo, 26-hr
11/5/1966 17:00	1	0.25	0.25	<2-mo
11/8/1966 11:00	19	0.90	0.23	<2-mo
11/10/1966 11:00	7	0.77	0.27	<2-mo
11/27/1966 7:00	8	0.43	0.35	<2-mo
11/28/1966 17:00	26	0.15	0.02	<2-mo
12/6/1966 4:00	1	0.65	0.65	3-mo, 1-hr
12/7/1966 0:00	14	0.20	0.04	<2-mo
12/9/1966 3:00	23	0.57	0.07	<2-mo
12/11/1966 0:00	1	1.03	1.03	1-yr, 1-hr
12/28/1966 5:00	18	0.38	0.12	<2-mo
1/26/1967 7:00	1	0.24	0.24	<2-mo
1/27/1967 2:00	20	0.43	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
1/31/1967 11:00	2	0.16	0.10	<2-mo
2/1/1967 19:00	21	0.69	0.17	<2-mo
2/15/1967 23:00	2	0.15	0.10	<2-mo
2/20/1967 8:00	20	0.15	0.03	<2-mo
2/26/1967 7:00	1	0.13	0.13	<2-mo
2/27/1967 8:00	16	0.32	0.07	<2-mo
3/5/1967 8:00	53	2.76	0.76	1.5-yr, 53-hr
3/13/1967 19:00	10	0.85	0.52	<2-mo
3/14/1967 22:00	7	0.33	0.15	<2-mo
3/15/1967 17:00	4	0.10	0.05	<2-mo
3/21/1967 7:00	1	0.89	0.89	6-mo, 1-hr
3/28/1967 14:00	1	1.00	1.00	11-mo, 1-hr
4/4/1967 23:00	19	0.90	0.16	<2-mo
4/10/1967 2:00	4	0.13	0.07	<2-mo
4/13/1967 3:00	14	0.38	0.11	<2-mo
4/17/1967 10:00	2	0.14	0.10	<2-mo
4/24/1967 3:00	1	1.03	1.03	1-yr, 1-hr
4/26/1967 20:00	3	0.15	0.09	<2-mo
5/1/1967 9:00	34	0.45	0.09	<2-mo
5/5/1967 23:00	56	1.52	0.11	3-mo, 56-hr
5/11/1967 2:00	9	1.00	0.38	2-mo, 9-hr
5/14/1967 5:00	8	0.20	0.07	<2-mo
5/15/1967 3:00	7	0.73	0.25	<2-mo
5/17/1967 5:00	16	0.46	0.19	<2-mo
5/28/1967 19:00	6	0.53	0.27	<2-mo
5/30/1967 1:00	4	0.28	0.14	<2-mo
6/18/1967 2:00	1	1.60	1.60	5-yr, 1-hr
6/22/1967 8:00	12	0.19	0.07	<2-mo
6/28/1967 14:00	5	0.38	0.27	<2-mo
7/2/1967 19:00	1	0.59	0.59	2-mo, 1-hr
7/18/1967 20:00	3	0.88	0.61	3-mo, 3-hr
7/19/1967 12:00	5	0.69	0.67	<2-mo
7/20/1967 9:00	9	0.58	0.34	<2-mo
7/27/1967 18:00	14	0.55	0.30	<2-mo
7/30/1967 20:00	3	0.23	0.12	<2-mo
8/2/1967 17:00	2	1.62	1.60	2-yr, 2-hr
8/9/1967 4:00	3	0.30	0.14	<2-mo
8/30/1967 22:00	5	0.29	0.15	<2-mo
9/9/1967 4:00	17	0.69	0.21	<2-mo
9/21/1967 12:00	9	0.39	0.20	<2-mo
9/27/1967 15:00	38	3.01	0.62	2-yr, 38-hr
10/5/1967 16:00	1	0.12	0.12	<2-mo
10/6/1967 11:00	4	0.10	0.04	<2-mo
10/8/1967 8:00	16	0.18	0.05	<2-mo
10/13/1967 19:00	3	0.12	0.09	<2-mo
10/17/1967 19:00	27	0.25	0.06	<2-mo
10/24/1967 23:00	5	0.18	0.11	<2-mo
11/1/1967 11:00	27	1.00	0.10	<2-mo
11/3/1967 20:00	8	0.21	0.09	<2-mo
11/11/1967 13:00	6	0.45	0.13	<2-mo
11/17/1967 2:00	10	0.43	0.09	<2-mo
11/22/1967 16:00	7	0.20	0.07	<2-mo
11/30/1967 4:00	10	0.67	0.17	<2-mo
12/3/1967 8:00	1	0.45	0.45	<2-mo
12/10/1967 12:00	9	0.39	0.17	<2-mo
12/11/1967 11:00	18	0.46	0.24	<2-mo
12/14/1967 2:00	13	0.29	0.06	<2-mo
12/17/1967 22:00	11	0.28	0.06	<2-mo
12/21/1967 1:00	8	0.13	0.05	<2-mo
12/21/1967 21:00	7	0.54	0.16	<2-mo
12/28/1967 2:00	13	0.28	0.06	<2-mo
1/6/1968 12:00	16	0.18	0.05	<2-mo
1/13/1968 2:00	26	1.10	0.09	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
1/15/1968 12:00	1	0.15	0.15	<2-mo
1/28/1968 7:00	55	0.94	0.14	<2-mo
2/2/1968 7:00	3	0.26	0.25	<2-mo
3/12/1968 2:00	26	0.97	0.25	<2-mo
3/16/1968 7:00	10	0.40	0.06	<2-mo
3/20/1968 3:00	74	2.74	0.33	1.5-yr, 74-hr
3/31/1968 18:00	8	0.23	0.06	<2-mo
4/3/1968 14:00	19	0.43	0.27	<2-mo
4/10/1968 16:00	5	0.14	0.08	<2-mo
4/14/1968 20:00	3	0.61	0.45	<2-mo
4/17/1968 18:00	3	0.10	0.04	<2-mo
4/23/1968 9:00	13	0.35	0.10	<2-mo
4/26/1968 19:00	4	0.41	0.28	<2-mo
4/30/1968 2:00	7	0.23	0.06	<2-mo
5/3/1968 17:00	5	0.40	0.24	<2-mo
5/9/1968 3:00	8	0.20	0.08	<2-mo
5/11/1968 2:00	17	1.29	0.30	3-mo, 17-hr
5/14/1968 12:00	3	0.15	0.12	<2-mo
5/15/1968 20:00	11	0.54	0.16	<2-mo
5/17/1968 22:00	12	0.46	0.11	<2-mo
5/23/1968 1:00	31	3.62	0.79	7-yr, 31-hr
5/26/1968 15:00	29	3.73	0.64	10-yr, 29-hr
5/29/1968 11:00	5	0.12	0.06	<2-mo
5/30/1968 8:00	1	0.15	0.15	<2-mo
6/1/1968 23:00	7	0.75	0.21	<2-mo
6/10/1968 14:00	6	0.13	0.05	<2-mo
6/11/1968 23:00	2	0.94	0.93	4-mo, 2-hr
6/15/1968 5:00	3	0.39	0.14	<2-mo
6/19/1968 5:00	3	0.10	0.05	<2-mo
6/23/1968 1:00	2	0.39	0.28	<2-mo
6/25/1968 10:00	2	0.24	0.22	<2-mo
6/26/1968 15:00	6	0.47	0.25	<2-mo
7/8/1968 14:00	1	0.32	0.32	<2-mo
7/10/1968 15:00	4	1.25	0.88	6-mo, 4-hr
7/22/1968 14:00	5	0.25	0.20	<2-mo
7/31/1968 15:00	3	0.14	0.09	<2-mo
8/1/1968 5:00	8	0.88	0.62	<2-mo
8/4/1968 8:00	4	0.62	0.49	<2-mo
8/6/1968 13:00	2	0.14	0.12	<2-mo
8/7/1968 14:00	1	0.90	0.90	8-mo, 1-hr
8/13/1968 8:00	3	0.10	0.08	<2-mo
10/6/1968 13:00	9	0.45	0.10	<2-mo
10/10/1968 6:00	3	0.12	0.05	<2-mo
10/18/1968 11:00	12	0.42	0.08	<2-mo
11/6/1968 11:00	41	0.62	0.10	<2-mo
11/19/1968 12:00	1	1.82	1.82	10-yr, 1-hr
11/28/1968 6:00	13	0.80	0.20	<2-mo
12/1/1968 16:00	14	0.20	0.08	<2-mo
12/3/1968 0:00	13	0.37	0.05	<2-mo
12/4/1968 3:00	3	0.15	0.08	<2-mo
12/18/1968 5:00	32	0.85	0.35	<2-mo
12/22/1968 9:00	11	0.65	0.09	<2-mo
12/27/1968 2:00	40	1.20	0.16	2-mo, 40-hr
1/8/1969 22:00	6	0.12	0.04	<2-mo
1/17/1969 16:00	9	0.38	0.11	<2-mo
1/28/1969 10:00	59	2.33	0.30	9-mo, 59-hr
2/3/1969 8:00	1	0.10	0.10	<2-mo
2/6/1969 12:00	9	0.18	0.04	<2-mo
2/8/1969 13:00	20	0.91	0.21	<2-mo
2/23/1969 10:00	1	0.11	0.11	<2-mo
3/20/1969 15:00	3	0.10	0.05	<2-mo
3/24/1969 2:00	43	1.23	0.24	2-mo, 43-hr
3/29/1969 3:00	4	0.10	0.04	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
4/2/1969 8:00	5	0.24	0.08	<2-mo
4/4/1969 23:00	20	0.84	0.23	<2-mo
4/14/1969 19:00	24	0.41	0.08	<2-mo
4/18/1969 3:00	18	0.80	0.25	<2-mo
4/19/1969 14:00	1	0.14	0.14	<2-mo
4/21/1969 13:00	4	0.12	0.06	<2-mo
4/22/1969 16:00	29	0.24	0.05	<2-mo
4/28/1969 5:00	10	0.16	0.08	<2-mo
5/8/1969 3:00	44	1.32	0.28	2.5-mo, 44-hr
5/18/1969 7:00	11	0.24	0.08	<2-mo
6/2/1969 10:00	13	0.63	0.15	<2-mo
6/5/1969 8:00	4	0.13	0.06	<2-mo
6/8/1969 17:00	4	0.10	0.05	<2-mo
6/12/1969 19:00	15	0.98	0.27	<2-mo
6/14/1969 18:00	4	0.84	0.65	2-mo, 4-hr
6/24/1969 14:00	5	0.40	0.21	<2-mo
6/25/1969 13:00	1	0.92	0.92	8.5-mo, 1-hr
6/30/1969 23:00	1	0.25	0.25	<2-mo
7/5/1969 22:00	1	0.32	0.32	<2-mo
7/6/1969 12:00	1	0.24	0.24	<2-mo
7/7/1969 11:00	2	0.65	0.60	<2-mo
7/20/1969 7:00	7	0.88	0.37	<2-mo
8/9/1969 8:00	11	1.88	0.70	1-yr, 11-hr
8/17/1969 21:00	1	0.53	0.53	<2-mo
9/7/1969 19:00	1	0.11	0.11	<2-mo
9/17/1969 12:00	3	0.19	0.16	<2-mo
9/24/1969 9:00	5	0.10	0.04	<2-mo
10/2/1969 3:00	20	1.61	0.50	5-mo, 20-hr
10/13/1969 22:00	6	0.10	0.03	<2-mo
10/20/1969 19:00	3	0.30	0.23	<2-mo
11/1/1969 5:00	24	1.36	0.21	3-mo, 24-hr
11/4/1969 14:00	7	0.10	0.03	<2-mo
11/13/1969 19:00	19	0.23	0.05	<2-mo
11/17/1969 21:00	15	0.88	0.22	<2-mo
11/23/1969 15:00	5	0.13	0.04	<2-mo
12/7/1969 2:00	11	0.45	0.11	<2-mo
12/10/1969 17:00	48	0.53	0.05	<2-mo
12/21/1969 17:00	10	0.17	0.03	<2-mo
12/23/1969 10:00	10	0.22	0.06	<2-mo
12/25/1969 11:00	6	0.11	0.03	<2-mo
12/29/1969 13:00	41	1.03	0.15	<2-mo
1/2/1970 16:00	1	0.15	0.15	<2-mo
1/11/1970 11:00	9	0.15	0.03	<2-mo
1/17/1970 13:00	1	0.10	0.10	<2-mo
1/29/1970 4:00	6	0.85	0.50	<2-mo
2/2/1970 7:00	27	0.71	0.45	<2-mo
2/7/1970 17:00	8	0.20	0.06	<2-mo
2/8/1970 16:00	21	0.50	0.07	<2-mo
2/14/1970 19:00	23	0.36	0.06	<2-mo
3/4/1970 20:00	11	1.50	1.12	6-mo, 11-hr
3/13/1970 7:00	7	0.68	0.50	<2-mo
3/14/1970 3:00	4	0.10	0.03	<2-mo
3/17/1970 19:00	12	0.32	0.05	<2-mo
3/25/1970 7:00	1	0.50	0.50	<2-mo
4/1/1970 17:00	19	2.50	0.94	2-yr, 19-hr
4/4/1970 11:00	8	0.15	0.03	<2-mo
4/13/1970 10:00	33	0.35	0.08	<2-mo
4/19/1970 7:00	24	0.80	0.25	<2-mo
4/23/1970 3:00	1	0.10	0.10	<2-mo
4/23/1970 23:00	17	2.60	0.90	2.5-yr, 17-hr
5/2/1970 5:00	8	0.40	0.10	<2-mo
5/10/1970 15:00	4	0.18	0.11	<2-mo
5/11/1970 21:00	24	1.30	0.62	2-mo, 24-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
5/17/1970 16:00	1	0.80	0.80	5-mo, 1-hr
5/23/1970 20:00	23	0.50	0.20	<2-mo
5/25/1970 21:00	15	0.18	0.08	<2-mo
6/3/1970 14:00	53	0.67	0.15	<2-mo
6/11/1970 15:00	4	0.85	0.78	2-mo, 4-hr
6/12/1970 10:00	11	0.15	0.08	<2-mo
6/13/1970 19:00	4	0.48	0.25	<2-mo
6/15/1970 0:00	10	0.62	0.42	<2-mo
6/17/1970 17:00	8	0.90	0.80	<2-mo
7/2/1970 16:00	1	0.30	0.30	<2-mo
7/8/1970 20:00	17	0.47	0.36	<2-mo
7/11/1970 2:00	4	0.15	0.09	<2-mo
7/20/1970 1:00	9	0.17	0.06	<2-mo
7/26/1970 14:00	7	1.30	0.94	5-mo, 7-hr
8/3/1970 17:00	1	0.25	0.25	<2-mo
8/9/1970 9:00	21	2.66	0.35	2-yr, 21-hr
8/20/1970 15:00	4	0.45	0.42	<2-mo
8/22/1970 17:00	11	0.65	0.33	<2-mo
9/3/1970 22:00	2	0.38	0.33	<2-mo
9/8/1970 21:00	1	0.38	0.38	<2-mo
9/13/1970 1:00	2	0.10	0.09	<2-mo
9/18/1970 12:00	9	0.10	0.06	<2-mo
9/21/1970 15:00	1	0.20	0.20	<2-mo
9/23/1970 13:00	2	1.13	1.12	8-mo, 2-hr
9/25/1970 0:00	10	1.59	0.72	8.5-mo, 10-hr
9/26/1970 19:00	13	0.77	0.31	<2-mo
10/9/1970 6:00	8	0.25	0.07	<2-mo
10/10/1970 4:00	12	0.90	0.25	<2-mo
10/12/1970 19:00	10	0.30	0.11	<2-mo
10/14/1970 7:00	12	0.27	0.10	<2-mo
10/20/1970 11:00	1	0.15	0.15	<2-mo
10/29/1970 7:00	27	0.60	0.14	<2-mo
11/2/1970 7:00	12	0.89	0.25	<2-mo
11/15/1970 2:00	1	1.00	1.00	11-mo, 1-hr
11/20/1970 1:00	12	0.37	0.12	<2-mo
11/25/1970 8:00	10	0.12	0.04	<2-mo
11/29/1970 15:00	5	0.15	0.11	<2-mo
12/3/1970 23:00	1	0.31	0.31	<2-mo
12/11/1970 9:00	28	1.03	0.23	<2-mo
12/13/1970 14:00	1	0.11	0.11	<2-mo
12/16/1970 9:00	22	0.37	0.10	<2-mo
12/21/1970 9:00	29	0.85	0.19	<2-mo
12/23/1970 4:00	15	0.24	0.11	<2-mo
1/4/1971 0:00	6	0.80	0.20	<2-mo
1/13/1971 14:00	17	0.70	0.10	<2-mo
1/29/1971 14:00	1	0.10	0.10	<2-mo
1/30/1971 14:00	1	0.10	0.10	<2-mo
2/4/1971 5:00	28	1.00	0.20	<2-mo
2/7/1971 13:00	1	0.10	0.10	<2-mo
2/8/1971 6:00	18	1.10	0.20	<2-mo
2/12/1971 20:00	9	0.30	0.10	<2-mo
2/17/1971 8:00	1	0.10	0.10	<2-mo
2/19/1971 22:00	1	0.10	0.10	<2-mo
2/22/1971 1:00	9	1.50	0.30	6-mo, 9-hr
2/22/1971 22:00	1	0.10	0.10	<2-mo
2/26/1971 14:00	1	0.10	0.10	<2-mo
3/3/1971 7:00	15	0.50	0.10	<2-mo
3/6/1971 13:00	9	0.90	0.20	<2-mo
3/10/1971 10:00	6	0.50	0.20	<2-mo
3/11/1971 20:00	13	0.40	0.10	<2-mo
3/15/1971 8:00	1	0.10	0.10	<2-mo
3/19/1971 9:00	1	0.10	0.10	<2-mo
3/22/1971 19:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
3/23/1971 12:00	1	0.10	0.10	<2-mo
4/1/1971 21:00	1	0.10	0.10	<2-mo
4/12/1971 16:00	1	0.10	0.10	<2-mo
4/13/1971 21:00	1	0.10	0.10	<2-mo
4/17/1971 17:00	1	0.10	0.10	<2-mo
4/27/1971 20:00	7	0.30	0.10	<2-mo
5/2/1971 8:00	1	0.10	0.10	<2-mo
5/2/1971 21:00	1	0.10	0.10	<2-mo
5/5/1971 16:00	1	0.10	0.10	<2-mo
5/6/1971 4:00	5	0.80	0.40	<2-mo
5/7/1971 15:00	8	1.20	0.30	4-mo, 8-hr
5/11/1971 22:00	1	0.10	0.10	<2-mo
5/12/1971 11:00	1	0.10	0.10	<2-mo
5/16/1971 19:00	2	0.20	0.10	<2-mo
5/24/1971 23:00	5	0.70	0.30	<2-mo
6/2/1971 5:00	1	0.10	0.10	<2-mo
6/5/1971 17:00	1	0.10	0.10	<2-mo
6/6/1971 12:00	1	0.10	0.10	<2-mo
6/13/1971 16:00	1	0.40	0.40	<2-mo
6/21/1971 1:00	2	0.30	0.20	<2-mo
6/21/1971 19:00	1	0.40	0.40	<2-mo
6/25/1971 19:00	9	1.90	1.10	1-yr, 9-hr
6/29/1971 1:00	1	0.10	0.10	<2-mo
7/9/1971 18:00	1	0.10	0.10	<2-mo
7/10/1971 17:00	21	0.90	0.50	<2-mo
7/15/1971 23:00	1	0.10	0.10	<2-mo
7/19/1971 1:00	1	0.10	0.10	<2-mo
7/24/1971 7:00	13	0.70	0.10	<2-mo
7/25/1971 11:00	7	0.20	0.10	<2-mo
7/28/1971 22:00	1	0.10	0.10	<2-mo
7/30/1971 14:00	1	0.10	0.10	<2-mo
8/3/1971 11:00	22	0.70	0.10	<2-mo
8/10/1971 10:00	8	0.60	0.30	<2-mo
8/20/1971 10:00	3	0.40	0.20	<2-mo
8/21/1971 23:00	12	0.30	0.20	<2-mo
8/25/1971 12:00	16	1.70	0.70	8-mo, 16-hr
9/3/1971 9:00	3	0.50	0.30	<2-mo
9/6/1971 17:00	3	0.30	0.10	<2-mo
9/13/1971 10:00	9	0.30	0.10	<2-mo
9/14/1971 11:00	1	0.10	0.10	<2-mo
9/16/1971 9:00	2	0.20	0.10	<2-mo
9/19/1971 2:00	1	0.10	0.10	<2-mo
9/25/1971 20:00	7	0.50	0.30	<2-mo
10/9/1971 11:00	9	0.30	0.10	<2-mo
10/14/1971 1:00	2	0.20	0.10	<2-mo
10/16/1971 12:00	1	0.10	0.10	<2-mo
10/22/1971 9:00	1	0.10	0.10	<2-mo
10/23/1971 14:00	20	0.40	0.10	<2-mo
11/2/1971 9:00	2	0.20	0.10	<2-mo
11/6/1971 17:00	4	0.30	0.10	<2-mo
11/9/1971 16:00	1	0.10	0.10	<2-mo
11/19/1971 6:00	3	0.30	0.10	<2-mo
11/27/1971 3:00	3	0.20	0.10	<2-mo
11/29/1971 3:00	8	0.50	0.10	<2-mo
11/30/1971 4:00	1	0.10	0.10	<2-mo
12/5/1971 20:00	38	1.90	0.20	6-mo, 38-hr
12/14/1971 9:00	3	0.30	0.10	<2-mo
12/15/1971 12:00	1	0.20	0.20	<2-mo
12/19/1971 22:00	6	0.30	0.10	<2-mo
12/27/1971 1:00	1	0.10	0.10	<2-mo
12/28/1971 3:00	1	0.10	0.10	<2-mo
12/30/1971 0:00	12	0.40	0.10	<2-mo
1/2/1972 4:00	5	0.30	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
1/4/1972 7:00	20	0.50	0.10	<2-mo
1/9/1972 5:00	13	0.30	0.10	<2-mo
1/20/1972 8:00	1	0.10	0.10	<2-mo
1/22/1972 12:00	11	0.30	0.10	<2-mo
1/24/1972 22:00	1	0.10	0.10	<2-mo
1/27/1972 20:00	3	0.20	0.10	<2-mo
2/3/1972 10:00	5	0.20	0.10	<2-mo
2/6/1972 5:00	10	0.30	0.10	<2-mo
2/9/1972 10:00	1	0.10	0.10	<2-mo
2/13/1972 3:00	17	0.70	0.10	<2-mo
2/18/1972 9:00	1	0.10	0.10	<2-mo
2/23/1972 21:00	1	0.10	0.10	<2-mo
2/25/1972 21:00	1	0.10	0.10	<2-mo
2/26/1972 11:00	1	0.10	0.10	<2-mo
3/1/1972 14:00	3	0.20	0.10	<2-mo
3/2/1972 7:00	14	0.80	0.10	<2-mo
3/3/1972 15:00	1	0.10	0.10	<2-mo
3/7/1972 21:00	1	0.10	0.10	<2-mo
3/12/1972 21:00	3	0.20	0.10	<2-mo
3/13/1972 18:00	1	0.10	0.10	<2-mo
3/16/1972 0:00	14	0.60	0.20	<2-mo
3/17/1972 4:00	6	0.40	0.10	<2-mo
3/21/1972 23:00	9	0.30	0.10	<2-mo
3/23/1972 13:00	1	0.10	0.10	<2-mo
3/29/1972 11:00	4	0.20	0.10	<2-mo
4/1/1972 11:00	1	0.10	0.10	<2-mo
4/3/1972 20:00	8	0.40	0.10	<2-mo
4/7/1972 1:00	16	1.20	0.30	3-mo, 16-hr
4/10/1972 13:00	1	0.10	0.10	<2-mo
4/12/1972 21:00	13	1.90	1.00	1-yr, 13-hr
4/15/1972 0:00	10	0.20	0.10	<2-mo
4/16/1972 5:00	13	0.90	0.20	<2-mo
4/19/1972 14:00	10	0.20	0.10	<2-mo
4/21/1972 14:00	13	0.80	0.20	<2-mo
4/23/1972 3:00	1	0.10	0.10	<2-mo
4/24/1972 16:00	1	0.10	0.10	<2-mo
5/2/1972 4:00	1	0.10	0.10	<2-mo
5/2/1972 20:00	1	0.10	0.10	<2-mo
5/8/1972 6:00	30	2.10	0.30	9-mo, 30-hr
5/13/1972 16:00	17	0.60	0.10	<2-mo
5/15/1972 1:00	19	0.30	0.10	<2-mo
5/29/1972 17:00	1	0.10	0.10	<2-mo
5/30/1972 12:00	4	0.30	0.10	<2-mo
7/2/1972 13:00	1	0.10	0.10	<2-mo
7/3/1972 4:00	8	0.30	0.10	<2-mo
7/4/1972 21:00	2	0.20	0.10	<2-mo
7/8/1972 10:00	1	0.10	0.10	<2-mo
7/9/1972 16:00	6	0.90	0.40	2-mo, 6-hr
7/10/1972 10:00	1	0.10	0.10	<2-mo
7/15/1972 18:00	1	0.10	0.10	<2-mo
7/22/1972 15:00	1	0.10	0.10	<2-mo
7/24/1972 18:00	1	0.30	0.30	<2-mo
8/2/1972 18:00	1	0.10	0.10	<2-mo
8/3/1972 18:00	1	0.10	0.10	<2-mo
8/12/1972 15:00	2	1.40	1.20	1.5-yr, 2-hr
8/17/1972 18:00	8	1.20	0.40	4-mo, 8-hr
8/18/1972 14:00	7	0.40	0.20	<2-mo
8/19/1972 12:00	2	0.20	0.10	<2-mo
8/23/1972 9:00	1	0.20	0.20	<2-mo
8/24/1972 19:00	1	0.10	0.10	<2-mo
9/3/1972 8:00	3	0.20	0.10	<2-mo
9/12/1972 4:00	12	0.70	0.30	<2-mo
9/18/1972 11:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
9/23/1972 18:00	1	0.10	0.10	<2-mo
9/24/1972 8:00	4	0.50	0.20	<2-mo
9/25/1972 8:00	1	0.10	0.10	<2-mo
9/26/1972 11:00	3	0.30	0.10	<2-mo
9/27/1972 12:00	3	0.70	0.40	<2-mo
9/29/1972 7:00	6	0.30	0.10	<2-mo
9/30/1972 0:00	12	0.40	0.10	<2-mo
10/4/1972 15:00	1	0.10	0.10	<2-mo
10/12/1972 0:00	5	1.20	0.40	5-mo, 5-hr
10/18/1972 11:00	4	0.20	0.10	<2-mo
10/23/1972 4:00	6	0.20	0.10	<2-mo
10/27/1972 21:00	5	0.20	0.10	<2-mo
10/28/1972 23:00	3	0.20	0.10	<2-mo
10/31/1972 17:00	21	1.50	0.30	4-mo, 21-hr
11/2/1972 5:00	11	0.50	0.10	<2-mo
11/7/1972 6:00	23	1.80	0.50	6-mo, 23-hr
11/10/1972 16:00	4	0.20	0.10	<2-mo
11/13/1972 17:00	19	1.20	0.20	2-mo, 19-hr
11/19/1972 13:00	12	0.50	0.10	<2-mo
11/25/1972 17:00	1	0.10	0.10	<2-mo
11/28/1972 5:00	5	0.30	0.10	<2-mo
12/1/1972 16:00	1	0.10	0.10	<2-mo
12/4/1972 20:00	1	0.10	0.10	<2-mo
12/6/1972 6:00	3	0.40	0.20	<2-mo
12/8/1972 5:00	17	1.20	0.20	3-mo, 17-hr
12/12/1972 8:00	18	0.30	0.10	<2-mo
12/15/1972 15:00	1	0.40	0.40	<2-mo
12/19/1972 12:00	18	0.60	0.10	<2-mo
12/26/1972 6:00	4	0.20	0.10	<2-mo
12/30/1972 20:00	1	0.10	0.10	<2-mo
12/31/1972 12:00	1	0.10	0.10	<2-mo
1/3/1973 17:00	6	0.70	0.20	<2-mo
1/15/1973 2:00	3	0.20	0.10	<2-mo
1/19/1973 5:00	5	0.40	0.20	<2-mo
1/21/1973 23:00	5	0.50	0.20	<2-mo
1/22/1973 22:00	1	0.10	0.10	<2-mo
1/27/1973 1:00	5	0.30	0.10	<2-mo
1/28/1973 18:00	4	0.20	0.10	<2-mo
2/1/1973 15:00	4	0.30	0.10	<2-mo
2/2/1973 11:00	1	0.10	0.10	<2-mo
2/6/1973 12:00	1	0.10	0.10	<2-mo
2/8/1973 2:00	7	0.30	0.10	<2-mo
2/14/1973 13:00	11	0.40	0.10	<2-mo
2/15/1973 19:00	1	0.10	0.10	<2-mo
3/3/1973 10:00	1	0.10	0.10	<2-mo
3/5/1973 2:00	1	0.10	0.10	<2-mo
3/7/1973 6:00	1	0.10	0.10	<2-mo
3/11/1973 23:00	1	0.10	0.10	<2-mo
3/14/1973 19:00	2	0.40	0.20	<2-mo
3/16/1973 7:00	16	1.10	0.30	2-mo, 16-hr
3/17/1973 13:00	1	0.10	0.10	<2-mo
3/25/1973 10:00	1	0.10	0.10	<2-mo
3/25/1973 22:00	3	0.30	0.10	<2-mo
3/28/1973 18:00	12	0.20	0.10	<2-mo
3/29/1973 19:00	4	0.30	0.10	<2-mo
3/31/1973 16:00	1	0.10	0.10	<2-mo
4/4/1973 4:00	8	0.90	0.20	<2-mo
4/7/1973 17:00	15	0.70	0.10	<2-mo
4/9/1973 16:00	3	0.40	0.20	<2-mo
4/12/1973 5:00	7	0.60	0.20	<2-mo
4/17/1973 8:00	9	0.20	0.10	<2-mo
4/23/1973 5:00	10	1.30	0.30	4-mo, 10-hr
4/25/1973 9:00	3	0.20	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event Date/Time	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
4/27/1973 2:00	20	1.20	0.20	2-mo, 20-hr
5/2/1973 4:00	4	0.20	0.10	<2-mo
5/2/1973 22:00	7	0.40	0.20	<2-mo
5/8/1973 8:00	9	0.50	0.20	<2-mo
5/9/1973 11:00	11	0.20	0.10	<2-mo
5/10/1973 23:00	1	0.10	0.10	<2-mo
5/16/1973 22:00	2	0.20	0.10	<2-mo
5/19/1973 12:00	10	0.70	0.20	<2-mo
5/24/1973 8:00	4	0.30	0.20	<2-mo
5/25/1973 19:00	2	0.40	0.30	<2-mo
5/27/1973 4:00	19	0.40	0.10	<2-mo
5/28/1973 20:00	1	0.10	0.10	<2-mo
5/29/1973 21:00	1	0.10	0.10	<2-mo
5/30/1973 10:00	2	0.20	0.10	<2-mo
6/4/1973 15:00	6	0.70	0.20	<2-mo
6/6/1973 19:00	1	0.10	0.10	<2-mo
6/12/1973 15:00	1	0.10	0.10	<2-mo
6/16/1973 5:00	19	3.90	1.80	15-yr, 19-hr
6/17/1973 15:00	2	1.30	1.00	1-yr, 2-hr
6/20/1973 10:00	1	0.10	0.10	<2-mo
6/21/1973 5:00	1	0.40	0.40	<2-mo
6/27/1973 2:00	1	0.10	0.10	<2-mo
6/27/1973 17:00	1	0.10	0.10	<2-mo
6/29/1973 16:00	1	0.10	0.10	<2-mo
8/1/1973 0:00	1	6.90	6.90	>100-yr, 1-hr
8/1/1973 21:00	1	0.20	0.20	<2-mo
8/10/1973 16:00	3	0.20	0.10	<2-mo
8/13/1973 8:00	30	1.10	0.50	<2-mo
8/20/1973 6:00	2	0.50	0.40	<2-mo
9/6/1973 0:00	1	0.10	0.10	<2-mo
9/9/1973 11:00	4	0.50	0.20	<2-mo
9/14/1973 8:00	1	0.10	0.10	<2-mo
9/17/1973 22:00	3	0.40	0.20	<2-mo
9/22/1973 19:00	4	0.90	0.50	3-mo, 4-hr
9/29/1973 16:00	1	0.10	0.10	<2-mo
10/1/1973 6:00	11	1.90	0.90	1-yr, 11-hr
10/2/1973 8:00	1	0.10	0.10	<2-mo
10/4/1973 18:00	3	0.40	0.30	<2-mo
10/13/1973 21:00	1	0.10	0.10	<2-mo
10/28/1973 5:00	33	1.70	0.10	4.5-mo, 33-hr
10/30/1973 1:00	2	0.20	0.10	<2-mo
10/30/1973 23:00	1	0.10	0.10	<2-mo
10/31/1973 18:00	5	0.30	0.10	<2-mo
11/5/1973 4:00	2	0.20	0.10	<2-mo
11/15/1973 13:00	6	0.80	0.30	<2-mo
11/21/1973 4:00	3	0.20	0.10	<2-mo
11/24/1973 6:00	8	0.20	0.10	<2-mo
11/25/1973 1:00	8	1.50	0.40	8-mo, 8-hr
11/26/1973 11:00	3	0.60	0.40	<2-mo
11/27/1973 9:00	21	0.60	0.10	<2-mo
3/11/1974 13:00	1	0.10	0.10	<2-mo
3/15/1974 16:00	7	0.60	0.20	<2-mo
3/17/1974 12:00	1	0.10	0.10	<2-mo
3/21/1974 1:00	3	0.40	0.20	<2-mo
3/23/1974 18:00	6	0.50	0.20	<2-mo
3/29/1974 8:00	27	0.80	0.30	<2-mo
4/1/1974 16:00	6	0.70	0.30	<2-mo
4/3/1974 12:00	17	0.70	0.20	<2-mo
4/5/1974 23:00	1	0.10	0.10	<2-mo
4/8/1974 19:00	1	0.90	0.90	8-mo, 1-hr
4/14/1974 15:00	1	0.10	0.10	<2-mo
4/22/1974 7:00	10	0.50	0.10	<2-mo
4/23/1974 14:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
4/30/1974 16:00	3	0.40	0.20	<2-mo
5/2/1974 13:00	8	1.00	0.50	2-mo, 8-hr
5/8/1974 15:00	10	0.20	0.10	<2-mo
5/12/1974 0:00	9	0.70	0.10	<2-mo
5/15/1974 6:00	1	0.10	0.10	<2-mo
5/17/1974 18:00	11	1.90	0.50	1-yr, 11-hr
5/22/1974 21:00	5	0.20	0.10	<2-mo
5/24/1974 0:00	2	0.30	0.20	<2-mo
5/28/1974 22:00	5	0.20	0.10	<2-mo
5/29/1974 15:00	3	0.70	0.50	<2-mo
6/6/1974 9:00	11	0.50	0.20	<2-mo
6/8/1974 16:00	1	0.10	0.10	<2-mo
6/11/1974 18:00	2	0.20	0.10	<2-mo
6/12/1974 15:00	1	0.10	0.10	<2-mo
6/15/1974 5:00	2	0.40	0.30	<2-mo
6/16/1974 12:00	11	0.50	0.20	<2-mo
6/19/1974 15:00	1	0.10	0.10	<2-mo
6/21/1974 2:00	1	0.20	0.20	<2-mo
6/22/1974 12:00	21	1.90	0.40	9-mo, 21-hr
6/25/1974 14:00	7	0.20	0.10	<2-mo
6/28/1974 14:00	1	0.30	0.30	<2-mo
7/1/1974 0:00	1	0.10	0.10	<2-mo
7/10/1974 14:00	9	1.10	0.80	3-mo, 9-hr
7/23/1974 8:00	1	0.10	0.10	<2-mo
7/28/1974 20:00	3	0.30	0.20	<2-mo
7/29/1974 14:00	1	0.50	0.50	<2-mo
8/2/1974 20:00	27	1.30	0.60	3-mo, 27-hr
8/8/1974 2:00	6	0.80	0.30	<2-mo
8/9/1974 12:00	1	0.10	0.10	<2-mo
8/11/1974 14:00	1	0.10	0.10	<2-mo
8/16/1974 23:00	7	0.60	0.40	<2-mo
8/18/1974 13:00	6	0.40	0.20	<2-mo
8/27/1974 20:00	22	0.60	0.10	<2-mo
8/29/1974 10:00	21	2.10	0.80	1-yr, 21-hr
8/31/1974 13:00	1	0.10	0.10	<2-mo
9/1/1974 2:00	10	0.60	0.40	<2-mo
9/2/1974 20:00	13	0.70	0.20	<2-mo
9/3/1974 20:00	4	0.20	0.10	<2-mo
9/13/1974 13:00	6	0.60	0.20	<2-mo
9/20/1974 7:00	29	1.30	0.40	2-mo, 29-hr
9/29/1974 5:00	1	0.10	0.10	<2-mo
10/13/1974 21:00	1	0.10	0.10	<2-mo
10/15/1974 2:00	6	0.40	0.10	<2-mo
10/15/1974 23:00	16	0.30	0.10	<2-mo
10/30/1974 6:00	1	0.10	0.10	<2-mo
11/2/1974 11:00	1	0.10	0.10	<2-mo
11/4/1974 7:00	12	0.40	0.10	<2-mo
11/7/1974 17:00	1	0.10	0.10	<2-mo
11/11/1974 14:00	18	0.80	0.10	<2-mo
11/20/1974 0:00	6	0.50	0.20	<2-mo
11/21/1974 13:00	1	0.10	0.10	<2-mo
11/24/1974 19:00	13	0.40	0.10	<2-mo
11/27/1974 16:00	1	0.10	0.10	<2-mo
11/30/1974 22:00	46	1.80	0.20	5.5-mo, 46-hr
12/7/1974 16:00	10	0.30	0.10	<2-mo
12/11/1974 21:00	1	0.10	0.10	<2-mo
12/15/1974 15:00	4	0.70	0.30	<2-mo
12/25/1974 1:00	4	0.20	0.10	<2-mo
12/31/1974 12:00	9	0.40	0.10	<2-mo
1/3/1975 4:00	2	0.20	0.10	<2-mo
1/3/1975 18:00	1	0.10	0.10	<2-mo
1/8/1975 16:00	8	0.30	0.10	<2-mo
1/10/1975 6:00	14	0.50	0.20	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
1/13/1975 5:00	1	0.10	0.10	<2-mo
1/18/1975 5:00	3	0.30	0.10	<2-mo
1/19/1975 10:00	10	0.20	0.10	<2-mo
1/25/1975 10:00	3	0.20	0.10	<2-mo
1/29/1975 6:00	8	0.20	0.10	<2-mo
1/31/1975 2:00	7	0.40	0.10	<2-mo
2/1/1975 4:00	1	0.10	0.10	<2-mo
2/4/1975 13:00	5	0.20	0.10	<2-mo
2/5/1975 16:00	15	0.30	0.10	<2-mo
2/9/1975 7:00	1	0.10	0.10	<2-mo
2/12/1975 1:00	8	0.60	0.20	<2-mo
2/16/1975 10:00	1	0.10	0.10	<2-mo
2/17/1975 9:00	6	0.20	0.10	<2-mo
2/22/1975 19:00	30	2.90	0.40	2.5-yr, 30-hr
4/2/1975 23:00	1	0.20	0.20	<2-mo
4/18/1975 13:00	1	0.10	0.10	<2-mo
4/19/1975 3:00	2	0.30	0.20	<2-mo
4/22/1975 7:00	1	0.10	0.10	<2-mo
4/23/1975 16:00	23	1.40	0.40	3-mo, 23-hr
4/25/1975 8:00	7	0.60	0.10	<2-mo
4/27/1975 20:00	3	0.20	0.10	<2-mo
4/30/1975 19:00	1	0.10	0.10	<2-mo
5/2/1975 11:00	1	0.10	0.10	<2-mo
5/12/1975 5:00	17	0.80	0.30	<2-mo
5/15/1975 11:00	1	0.10	0.10	<2-mo
5/18/1975 4:00	1	0.10	0.10	<2-mo
5/22/1975 17:00	2	0.40	0.30	<2-mo
5/26/1975 5:00	1	0.20	0.20	<2-mo
5/27/1975 0:00	1	0.10	0.10	<2-mo
5/29/1975 17:00	2	0.20	0.10	<2-mo
5/31/1975 17:00	5	0.70	0.20	<2-mo
6/2/1975 15:00	1	0.10	0.10	<2-mo
6/5/1975 10:00	16	0.90	0.20	<2-mo
6/6/1975 13:00	1	0.10	0.10	<2-mo
6/11/1975 5:00	12	0.60	0.10	<2-mo
6/15/1975 15:00	1	0.10	0.10	<2-mo
6/17/1975 17:00	7	0.80	0.50	<2-mo
6/25/1975 9:00	11	0.60	0.40	<2-mo
6/26/1975 22:00	4	0.30	0.10	<2-mo
7/3/1975 22:00	7	0.60	0.40	<2-mo
7/6/1975 15:00	2	0.80	0.70	3-mo, 2-hr
7/10/1975 23:00	1	0.10	0.10	<2-mo
7/12/1975 9:00	1	0.10	0.10	<2-mo
7/13/1975 19:00	2	0.20	0.10	<2-mo
7/17/1975 14:00	2	0.30	0.20	<2-mo
7/18/1975 15:00	1	0.10	0.10	<2-mo
7/19/1975 13:00	1	0.10	0.10	<2-mo
7/20/1975 6:00	1	0.20	0.20	<2-mo
7/24/1975 17:00	4	0.80	0.60	2-mo, 4-hr
8/3/1975 16:00	1	0.10	0.10	<2-mo
8/4/1975 8:00	1	0.10	0.10	<2-mo
8/5/1975 4:00	3	0.70	0.50	<2-mo
8/10/1975 6:00	27	2.30	0.80	1-yr, 27-hr
8/14/1975 9:00	1	0.20	0.20	<2-mo
8/15/1975 6:00	4	0.80	0.30	2-mo, 4-hr
8/16/1975 10:00	4	0.40	0.20	<2-mo
8/29/1975 22:00	1	0.20	0.20	<2-mo
8/30/1975 18:00	1	0.20	0.20	<2-mo
8/31/1975 11:00	4	0.40	0.10	<2-mo
9/3/1975 21:00	2	0.50	0.40	<2-mo
9/5/1975 19:00	8	0.20	0.10	<2-mo
9/9/1975 6:00	1	0.10	0.10	<2-mo
9/11/1975 12:00	18	2.40	0.50	1.5-yr, 18-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
9/16/1975 5:00	5	0.20	0.10	<2-mo
9/17/1975 23:00	11	0.80	0.10	<2-mo
9/20/1975 5:00	4	0.20	0.10	<2-mo
9/23/1975 17:00	12	1.60	0.40	6-mo, 12-hr
10/8/1975 13:00	4	0.50	0.20	<2-mo
10/9/1975 5:00	3	0.20	0.10	<2-mo
10/17/1975 4:00	20	2.90	0.40	3-yr, 20-hr
10/18/1975 21:00	2	0.20	0.10	<2-mo
10/19/1975 19:00	10	0.20	0.10	<2-mo
10/29/1975 12:00	1	0.20	0.20	<2-mo
11/7/1975 10:00	1	0.10	0.10	<2-mo
11/9/1975 12:00	1	0.10	0.10	<2-mo
11/10/1975 0:00	10	0.60	0.20	<2-mo
11/12/1975 12:00	1	0.10	0.10	<2-mo
11/13/1975 21:00	1	0.10	0.10	<2-mo
11/25/1975 16:00	1	0.10	0.10	<2-mo
11/27/1975 1:00	1	0.10	0.10	<2-mo
11/29/1975 11:00	1	0.10	0.10	<2-mo
11/30/1975 13:00	4	0.40	0.10	<2-mo
12/6/1975 11:00	7	0.50	0.10	<2-mo
12/12/1975 20:00	5	0.40	0.20	<2-mo
12/15/1975 8:00	13	0.80	0.30	<2-mo
12/25/1975 20:00	15	0.90	0.20	<2-mo
12/27/1975 14:00	1	0.10	0.10	<2-mo
12/30/1975 3:00	9	0.20	0.10	<2-mo
12/31/1975 16:00	7	0.40	0.10	<2-mo
1/2/1976 15:00	11	0.40	0.10	<2-mo
1/6/1976 12:00	1	0.10	0.10	<2-mo
1/7/1976 15:00	1	0.10	0.10	<2-mo
1/11/1976 13:00	4	0.20	0.10	<2-mo
1/13/1976 13:00	7	0.80	0.20	<2-mo
1/20/1976 12:00	1	0.10	0.10	<2-mo
1/25/1976 12:00	19	0.60	0.10	<2-mo
1/31/1976 21:00	1	0.10	0.10	<2-mo
2/3/1976 16:00	1	0.10	0.10	<2-mo
2/5/1976 20:00	1	0.10	0.10	<2-mo
2/16/1976 3:00	24	1.00	0.20	<2-mo
2/17/1976 16:00	14	1.40	0.30	4-mo, 14-hr
2/18/1976 17:00	1	0.10	0.10	<2-mo
2/21/1976 15:00	8	0.30	0.10	<2-mo
3/5/1976 7:00	1	0.10	0.10	<2-mo
3/10/1976 19:00	4	0.30	0.10	<2-mo
3/12/1976 15:00	7	0.20	0.10	<2-mo
3/16/1976 14:00	1	0.10	0.10	<2-mo
3/19/1976 13:00	1	0.10	0.10	<2-mo
3/20/1976 23:00	9	0.80	0.20	<2-mo
3/27/1976 11:00	1	0.10	0.10	<2-mo
3/31/1976 7:00	6	0.50	0.10	<2-mo
4/1/1976 18:00	7	0.20	0.10	<2-mo
4/2/1976 18:00	1	0.10	0.10	<2-mo
4/4/1976 1:00	1	0.10	0.10	<2-mo
4/11/1976 7:00	1	0.10	0.10	<2-mo
4/21/1976 9:00	9	0.40	0.10	<2-mo
4/25/1976 7:00	13	0.30	0.10	<2-mo
5/1/1976 13:00	1	0.10	0.10	<2-mo
5/2/1976 21:00	1	0.10	0.10	<2-mo
5/5/1976 22:00	6	0.40	0.30	<2-mo
5/10/1976 11:00	1	0.20	0.20	<2-mo
5/14/1976 12:00	3	0.20	0.10	<2-mo
5/15/1976 10:00	9	0.20	0.10	<2-mo
5/16/1976 16:00	7	0.40	0.10	<2-mo
5/30/1976 14:00	1	0.10	0.10	<2-mo
5/31/1976 2:00	16	0.80	0.20	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
6/11/1976 15:00	2	0.50	0.30	<2-mo
6/15/1976 11:00	8	0.30	0.10	<2-mo
6/18/1976 2:00	27	1.60	0.40	4.5-mo, 27-hr
6/24/1976 8:00	14	0.80	0.20	<2-mo
6/25/1976 12:00	3	0.50	0.30	<2-mo
6/29/1976 23:00	5	1.10	0.70	4-mo, 5-hr
7/2/1976 18:00	1	0.10	0.10	<2-mo
7/6/1976 17:00	4	1.10	0.60	4-mo, 4-hr
7/7/1976 12:00	1	0.10	0.10	<2-mo
7/8/1976 3:00	4	0.40	0.30	<2-mo
7/8/1976 18:00	1	0.10	0.10	<2-mo
7/11/1976 21:00	3	0.90	0.60	3-mo, 3-hr
7/15/1976 19:00	2	0.70	0.50	2-mo, 2-hr
7/16/1976 13:00	6	0.30	0.10	<2-mo
7/21/1976 17:00	1	0.20	0.20	<2-mo
7/22/1976 6:00	1	0.10	0.10	<2-mo
7/22/1976 22:00	22	2.20	1.00	1-yr, 22-hr
7/29/1976 10:00	1	0.70	0.70	4-mo, 1-hr
7/29/1976 22:00	1	0.10	0.10	<2-mo
7/31/1976 15:00	2	0.20	0.10	<2-mo
8/6/1976 5:00	26	1.80	0.60	6-mo, 26-hr
8/9/1976 14:00	1	0.10	0.10	<2-mo
8/14/1976 3:00	9	0.60	0.40	<2-mo
8/15/1976 6:00	2	0.60	0.40	<2-mo
8/21/1976 18:00	1	0.10	0.10	<2-mo
8/25/1976 14:00	1	0.10	0.10	<2-mo
8/26/1976 9:00	4	0.80	0.40	2-mo, 4-hr
8/28/1976 13:00	9	0.60	0.30	<2-mo
9/4/1976 20:00	1	0.10	0.10	<2-mo
9/9/1976 17:00	3	0.30	0.20	<2-mo
9/17/1976 20:00	1	0.10	0.10	<2-mo
9/24/1976 13:00	1	0.10	0.10	<2-mo
9/26/1976 10:00	9	0.40	0.20	<2-mo
9/27/1976 7:00	8	0.40	0.10	<2-mo
9/30/1976 2:00	4	0.20	0.10	<2-mo
10/6/1976 9:00	4	0.20	0.10	<2-mo
10/9/1976 7:00	6	0.60	0.10	<2-mo
10/11/1976 18:00	1	0.10	0.10	<2-mo
10/15/1976 15:00	1	0.10	0.10	<2-mo
10/20/1976 11:00	10	0.50	0.10	<2-mo
10/23/1976 21:00	16	0.70	0.10	<2-mo
10/25/1976 4:00	1	0.10	0.10	<2-mo
10/30/1976 17:00	9	0.60	0.10	<2-mo
10/31/1976 13:00	1	0.10	0.10	<2-mo
11/26/1976 21:00	5	0.20	0.10	<2-mo
12/1/1976 17:00	4	0.20	0.10	<2-mo
12/6/1976 20:00	9	0.40	0.10	<2-mo
12/12/1976 19:00	1	0.10	0.10	<2-mo
12/20/1976 10:00	1	0.10	0.10	<2-mo
12/28/1976 3:00	1	0.10	0.10	<2-mo
1/3/1977 17:00	1	0.10	0.10	<2-mo
1/4/1977 15:00	1	0.10	0.10	<2-mo
1/9/1977 15:00	10	0.40	0.10	<2-mo
1/14/1977 7:00	9	0.50	0.10	<2-mo
2/10/1977 15:00	1	0.10	0.10	<2-mo
2/15/1977 7:00	1	0.10	0.10	<2-mo
2/20/1977 8:00	1	0.10	0.10	<2-mo
2/25/1977 9:00	1	0.10	0.10	<2-mo
3/2/1977 14:00	1	0.10	0.10	<2-mo
3/3/1977 23:00	15	0.60	0.10	<2-mo
3/12/1977 20:00	8	0.90	0.30	<2-mo
3/18/1977 5:00	8	1.00	0.30	2-mo, 8-hr
3/20/1977 7:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
3/21/1977 15:00	21	0.40	0.10	<2-mo
3/28/1977 4:00	3	0.30	0.20	<2-mo
3/28/1977 18:00	1	0.10	0.10	<2-mo
4/2/1977 6:00	14	1.20	0.40	3-mo, 14-hr
4/4/1977 7:00	14	0.50	0.10	<2-mo
4/5/1977 17:00	1	0.10	0.10	<2-mo
4/22/1977 16:00	1	0.10	0.10	<2-mo
4/23/1977 9:00	1	0.10	0.10	<2-mo
4/25/1977 23:00	1	0.10	0.10	<2-mo
4/28/1977 12:00	8	0.80	0.20	<2-mo
5/2/1977 0:00	1	0.10	0.10	<2-mo
5/3/1977 13:00	23	1.00	0.40	<2-mo
5/5/1977 12:00	1	0.10	0.10	<2-mo
5/6/1977 12:00	23	0.40	0.10	<2-mo
5/29/1977 12:00	3	0.40	0.30	<2-mo
5/30/1977 12:00	1	0.10	0.10	<2-mo
6/8/1977 15:00	11	0.50	0.30	<2-mo
6/14/1977 0:00	13	0.60	0.30	<2-mo
6/18/1977 0:00	6	0.50	0.40	<2-mo
6/19/1977 12:00	1	0.30	0.30	<2-mo
6/26/1977 0:00	11	1.50	0.80	6-mo, 11-hr
6/27/1977 3:00	1	0.10	0.10	<2-mo
6/30/1977 19:00	5	0.50	0.20	<2-mo
7/1/1977 11:00	1	0.10	0.10	<2-mo
7/3/1977 1:00	1	0.20	0.20	<2-mo
7/3/1977 21:00	1	0.10	0.10	<2-mo
7/8/1977 7:00	1	0.10	0.10	<2-mo
7/11/1977 4:00	3	0.50	0.40	<2-mo
7/11/1977 23:00	8	0.40	0.20	<2-mo
7/15/1977 22:00	1	0.10	0.10	<2-mo
7/17/1977 1:00	1	0.10	0.10	<2-mo
7/21/1977 19:00	1	0.30	0.30	<2-mo
7/25/1977 11:00	4	0.30	0.10	<2-mo
7/29/1977 6:00	7	0.30	0.10	<2-mo
7/31/1977 23:00	1	0.10	0.10	<2-mo
8/6/1977 19:00	40	1.30	0.40	2-mo, 40-hr
8/10/1977 3:00	9	0.80	0.70	<2-mo
8/12/1977 17:00	1	0.20	0.20	<2-mo
8/14/1977 11:00	1	0.10	0.10	<2-mo
8/16/1977 23:00	1	0.30	0.30	<2-mo
8/25/1977 4:00	8	0.50	0.20	<2-mo
8/30/1977 16:00	3	0.40	0.30	<2-mo
8/31/1977 9:00	1	0.10	0.10	<2-mo
9/21/1977 11:00	1	2.80	2.80	>100-yr, 1-hr
9/25/1977 20:00	2	0.20	0.10	<2-mo
10/1/1977 4:00	7	1.00	0.50	2-mo, 7-hr
10/1/1977 23:00	2	0.30	0.20	<2-mo
10/6/1977 1:00	10	0.40	0.10	<2-mo
10/7/1977 23:00	13	0.60	0.20	<2-mo
10/26/1977 5:00	1	1.70	1.70	7-yr, 1-hr
12/20/1977 9:00	2	3.00	2.80	50-yr, 2-hr
1/1/1978 19:00	1	0.10	0.10	<2-mo
1/5/1978 20:00	1	0.10	0.10	<2-mo
1/7/1978 19:00	30	1.50	0.20	4-mo, 30-hr
1/13/1978 5:00	1	0.10	0.10	<2-mo
1/14/1978 0:00	1	0.10	0.10	<2-mo
1/14/1978 15:00	12	0.20	0.10	<2-mo
1/16/1978 21:00	22	0.90	0.10	<2-mo
1/19/1978 21:00	14	1.00	0.10	<2-mo
1/24/1978 17:00	34	1.20	0.10	2-mo, 34-hr
2/13/1978 16:00	2	0.30	0.20	<2-mo
2/16/1978 3:00	4	0.20	0.10	<2-mo
2/23/1978 22:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
3/3/1978 4:00	6	0.30	0.10	<2-mo
3/9/1978 0:00	1	0.10	0.10	<2-mo
3/12/1978 0:00	4	0.20	0.10	<2-mo
3/14/1978 2:00	8	0.40	0.10	<2-mo
3/16/1978 8:00	1	0.10	0.10	<2-mo
3/21/1978 13:00	1	0.10	0.10	<2-mo
3/22/1978 12:00	1	0.10	0.10	<2-mo
3/23/1978 18:00	5	0.20	0.10	<2-mo
3/25/1978 4:00	23	1.20	0.20	2-mo, 23-hr
3/26/1978 14:00	4	0.30	0.10	<2-mo
3/31/1978 10:00	1	0.10	0.10	<2-mo
4/3/1978 10:00	1	0.10	0.10	<2-mo
4/4/1978 16:00	1	0.10	0.10	<2-mo
4/6/1978 6:00	16	0.60	0.30	<2-mo
4/7/1978 16:00	1	0.10	0.10	<2-mo
4/11/1978 12:00	5	0.20	0.10	<2-mo
4/18/1978 10:00	14	1.60	0.50	6-mo, 14-hr
4/19/1978 16:00	3	0.30	0.20	<2-mo
4/21/1978 2:00	1	0.10	0.10	<2-mo
4/23/1978 15:00	6	0.20	0.10	<2-mo
4/25/1978 9:00	4	0.40	0.10	<2-mo
4/27/1978 10:00	1	0.10	0.10	<2-mo
5/4/1978 8:00	13	1.60	0.20	6-mo, 13-hr
5/5/1978 21:00	1	0.10	0.10	<2-mo
5/8/1978 12:00	24	0.80	0.30	<2-mo
5/12/1978 12:00	19	0.70	0.10	<2-mo
5/13/1978 18:00	1	0.10	0.10	<2-mo
5/14/1978 9:00	1	0.10	0.10	<2-mo
5/15/1978 8:00	1	0.10	0.10	<2-mo
5/19/1978 17:00	1	0.10	0.10	<2-mo
5/23/1978 9:00	4	0.20	0.10	<2-mo
5/24/1978 4:00	1	0.10	0.10	<2-mo
5/29/1978 13:00	10	1.40	0.60	5.5-mo, 10-hr
5/30/1978 13:00	3	0.20	0.10	<2-mo
6/2/1978 16:00	1	0.10	0.10	<2-mo
6/3/1978 4:00	1	0.10	0.10	<2-mo
6/7/1978 7:00	6	0.30	0.20	<2-mo
6/8/1978 2:00	13	0.70	0.30	<2-mo
6/9/1978 14:00	1	0.10	0.10	<2-mo
6/12/1978 14:00	5	0.30	0.20	<2-mo
6/18/1978 20:00	7	0.90	0.70	<2-mo
6/20/1978 23:00	2	0.30	0.20	<2-mo
6/27/1978 14:00	1	0.10	0.10	<2-mo
7/1/1978 11:00	8	0.40	0.30	<2-mo
7/2/1978 9:00	16	0.30	0.10	<2-mo
7/13/1978 8:00	1	0.10	0.10	<2-mo
7/14/1978 4:00	1	0.50	0.50	<2-mo
7/22/1978 18:00	1	0.20	0.20	<2-mo
7/23/1978 19:00	1	0.10	0.10	<2-mo
7/24/1978 7:00	8	0.60	0.30	<2-mo
7/30/1978 9:00	3	0.20	0.10	<2-mo
7/30/1978 23:00	5	0.20	0.10	<2-mo
8/5/1978 15:00	36	2.90	1.20	2.5-yr, 36-hr
8/7/1978 17:00	1	0.10	0.10	<2-mo
8/10/1978 4:00	9	0.50	0.20	<2-mo
8/12/1978 7:00	1	0.10	0.10	<2-mo
8/14/1978 18:00	1	0.20	0.20	<2-mo
8/16/1978 10:00	1	0.10	0.10	<2-mo
8/19/1978 19:00	1	0.10	0.10	<2-mo
8/28/1978 5:00	3	0.50	0.30	<2-mo
8/29/1978 0:00	1	0.10	0.10	<2-mo
8/29/1978 18:00	41	0.80	0.20	<2-mo
9/3/1978 17:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
9/16/1978 12:00	1	0.10	0.10	<2-mo
9/30/1978 18:00	3	0.80	0.40	2-mo, 3-hr
10/3/1978 20:00	4	0.40	0.20	<2-mo
10/5/1978 19:00	1	0.10	0.10	<2-mo
10/6/1978 22:00	1	0.10	0.10	<2-mo
10/11/1978 16:00	5	0.60	0.20	<2-mo
10/12/1978 18:00	50	2.10	0.60	7.5-mo, 50-hr
10/16/1978 5:00	13	0.30	0.10	<2-mo
10/18/1978 22:00	1	0.10	0.10	<2-mo
10/23/1978 15:00	3	0.20	0.10	<2-mo
10/26/1978 5:00	18	0.70	0.30	<2-mo
11/7/1978 14:00	1	0.10	0.10	<2-mo
11/8/1978 8:00	1	0.10	0.10	<2-mo
11/15/1978 14:00	2	0.20	0.10	<2-mo
11/17/1978 1:00	15	0.80	0.30	<2-mo
11/23/1978 17:00	1	0.10	0.10	<2-mo
11/26/1978 23:00	6	0.50	0.20	<2-mo
11/27/1978 16:00	1	0.10	0.10	<2-mo
12/3/1978 9:00	18	1.20	0.20	2-mo, 18-hr
12/7/1978 22:00	29	2.40	0.30	1.5-yr, 29-hr
12/11/1978 15:00	1	0.10	0.10	<2-mo
12/16/1978 18:00	1	0.10	0.10	<2-mo
12/20/1978 13:00	7	0.50	0.20	<2-mo
12/29/1978 14:00	1	0.10	0.10	<2-mo
12/30/1978 7:00	3	0.20	0.10	<2-mo
12/30/1978 23:00	21	0.90	0.20	<2-mo
1/1/1979 7:00	7	0.70	0.20	<2-mo
1/5/1979 17:00	8	0.20	0.10	<2-mo
1/7/1979 3:00	14	0.70	0.10	<2-mo
1/13/1979 9:00	1	0.10	0.10	<2-mo
1/13/1979 23:00	5	0.20	0.10	<2-mo
1/17/1979 7:00	1	0.10	0.10	<2-mo
1/20/1979 7:00	23	0.70	0.10	<2-mo
1/24/1979 6:00	7	0.50	0.10	<2-mo
1/27/1979 20:00	12	0.30	0.10	<2-mo
1/30/1979 11:00	1	0.10	0.10	<2-mo
2/7/1979 13:00	1	0.10	0.10	<2-mo
2/8/1979 23:00	1	0.10	0.10	<2-mo
2/12/1979 7:00	9	0.50	0.10	<2-mo
2/15/1979 5:00	1	0.10	0.10	<2-mo
2/16/1979 0:00	1	0.10	0.10	<2-mo
2/18/1979 14:00	11	0.30	0.10	<2-mo
2/21/1979 5:00	4	0.40	0.20	<2-mo
2/23/1979 6:00	9	0.50	0.20	<2-mo
2/25/1979 10:00	23	1.90	0.30	9-mo, 23-hr
2/28/1979 19:00	12	0.20	0.10	<2-mo
3/12/1979 18:00	1	0.10	0.10	<2-mo
3/14/1979 23:00	1	0.10	0.10	<2-mo
3/18/1979 8:00	1	0.10	0.10	<2-mo
3/23/1979 16:00	1	0.10	0.10	<2-mo
3/24/1979 6:00	7	0.40	0.20	<2-mo
3/31/1979 13:00	13	0.30	0.10	<2-mo
4/1/1979 16:00	17	1.20	0.20	3-mo, 17-hr
4/4/1979 9:00	9	0.60	0.20	<2-mo
4/8/1979 23:00	9	0.50	0.10	<2-mo
4/10/1979 12:00	1	0.10	0.10	<2-mo
4/12/1979 17:00	1	0.10	0.10	<2-mo
4/13/1979 16:00	7	0.70	0.40	<2-mo
4/14/1979 18:00	1	0.10	0.10	<2-mo
4/26/1979 10:00	1	0.20	0.20	<2-mo
4/26/1979 22:00	12	0.20	0.10	<2-mo
5/3/1979 9:00	4	0.70	0.30	<2-mo
5/4/1979 12:00	8	0.40	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
5/5/1979 17:00	1	0.10	0.10	<2-mo
5/12/1979 14:00	3	0.30	0.20	<2-mo
5/16/1979 13:00	1	0.10	0.10	<2-mo
5/21/1979 0:00	1	0.10	0.10	<2-mo
5/23/1979 8:00	5	0.30	0.10	<2-mo
5/24/1979 4:00	2	0.30	0.20	<2-mo
5/25/1979 6:00	26	0.80	0.10	<2-mo
5/27/1979 2:00	14	0.60	0.10	<2-mo
5/31/1979 11:00	12	0.60	0.20	<2-mo
6/20/1979 21:00	12	0.70	0.30	<2-mo
6/22/1979 14:00	1	0.10	0.10	<2-mo
6/24/1979 10:00	1	0.10	0.10	<2-mo
6/30/1979 0:00	2	0.80	0.70	3-mo, 2-hr
6/30/1979 16:00	1	0.10	0.10	<2-mo
7/4/1979 7:00	1	0.10	0.10	<2-mo
7/9/1979 0:00	9	0.50	0.20	<2-mo
7/10/1979 0:00	1	0.20	0.20	<2-mo
7/14/1979 12:00	1	0.10	0.10	<2-mo
7/24/1979 9:00	2	0.40	0.20	<2-mo
7/24/1979 22:00	4	0.50	0.20	<2-mo
7/25/1979 19:00	10	0.90	0.60	<2-mo
7/27/1979 8:00	14	0.80	0.30	<2-mo
7/28/1979 12:00	22	1.80	0.50	7.5-mo, 22-hr
8/1/1979 0:00	1	0.10	0.10	<2-mo
8/1/1979 19:00	5	0.20	0.10	<2-mo
8/5/1979 16:00	12	2.00	0.90	1-yr, 12-hr
8/8/1979 14:00	1	0.40	0.40	<2-mo
8/10/1979 15:00	29	2.60	0.50	1.5-yr, 29-hr
8/18/1979 1:00	31	0.70	0.20	<2-mo
8/20/1979 19:00	5	1.00	0.30	3-mo, 5-hr
8/23/1979 1:00	7	0.40	0.30	<2-mo
8/24/1979 10:00	8	0.60	0.40	<2-mo
8/26/1979 8:00	16	1.20	0.30	3-mo, 16-hr
8/28/1979 20:00	1	0.30	0.30	<2-mo
9/2/1979 21:00	1	0.10	0.10	<2-mo
9/13/1979 17:00	25	3.60	0.70	7-yr, 25-hr
9/21/1979 7:00	15	0.90	0.20	<2-mo
9/22/1979 11:00	2	0.20	0.10	<2-mo
9/28/1979 1:00	14	1.80	0.30	9-mo, 14-hr
10/2/1979 9:00	3	0.20	0.10	<2-mo
10/4/1979 10:00	2	0.20	0.10	<2-mo
10/8/1979 17:00	2	0.30	0.20	<2-mo
10/9/1979 14:00	4	0.20	0.10	<2-mo
10/11/1979 22:00	1	0.10	0.10	<2-mo
10/16/1979 19:00	9	0.30	0.10	<2-mo
10/20/1979 16:00	1	0.10	0.10	<2-mo
11/1/1979 19:00	3	0.30	0.10	<2-mo
11/3/1979 11:00	12	0.20	0.10	<2-mo
11/9/1979 12:00	13	0.60	0.20	<2-mo
11/15/1979 13:00	1	0.10	0.10	<2-mo
11/20/1979 17:00	1	0.10	0.10	<2-mo
11/22/1979 10:00	10	0.20	0.10	<2-mo
11/23/1979 21:00	10	0.50	0.10	<2-mo
11/25/1979 8:00	20	0.60	0.20	<2-mo
11/28/1979 10:00	5	0.20	0.10	<2-mo
12/7/1979 14:00	1	0.10	0.10	<2-mo
12/12/1979 11:00	24	0.80	0.10	<2-mo
12/22/1979 16:00	1	0.10	0.10	<2-mo
12/24/1979 1:00	9	0.50	0.10	<2-mo
12/25/1979 13:00	3	0.20	0.10	<2-mo
1/4/1980 16:00	18	0.50	0.10	<2-mo
1/5/1980 22:00	1	0.10	0.10	<2-mo
1/11/1980 11:00	11	0.90	0.20	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
1/24/1980 19:00	8	0.20	0.10	<2-mo
1/25/1980 17:00	1	0.10	0.10	<2-mo
2/3/1980 21:00	1	0.10	0.10	<2-mo
2/6/1980 15:00	1	0.10	0.10	<2-mo
2/15/1980 18:00	10	0.40	0.10	<2-mo
2/21/1980 18:00	1	0.10	0.10	<2-mo
2/25/1980 18:00	8	0.50	0.10	<2-mo
2/26/1980 17:00	1	0.10	0.10	<2-mo
2/28/1980 6:00	7	0.20	0.10	<2-mo
3/4/1980 14:00	21	0.50	0.10	<2-mo
3/8/1980 1:00	15	0.30	0.10	<2-mo
3/13/1980 9:00	1	0.10	0.10	<2-mo
3/13/1980 21:00	1	0.10	0.10	<2-mo
3/14/1980 10:00	1	0.10	0.10	<2-mo
3/17/1980 7:00	11	0.40	0.10	<2-mo
3/18/1980 13:00	1	0.10	0.10	<2-mo
3/21/1980 1:00	11	0.90	0.20	<2-mo
3/24/1980 12:00	2	0.20	0.10	<2-mo
3/28/1980 14:00	9	0.70	0.20	<2-mo
3/30/1980 17:00	6	0.60	0.30	<2-mo
3/31/1980 17:00	1	0.10	0.10	<2-mo
4/1/1980 11:00	1	0.10	0.10	<2-mo
4/8/1980 13:00	6	0.80	0.40	<2-mo
4/9/1980 11:00	13	0.30	0.10	<2-mo
4/12/1980 6:00	8	0.40	0.10	<2-mo
4/13/1980 19:00	18	0.70	0.20	<2-mo
4/16/1980 11:00	1	0.10	0.10	<2-mo
5/12/1980 3:00	21	1.50	0.40	4-mo, 21-hr
5/17/1980 3:00	29	1.20	0.20	2-mo, 29-hr
5/18/1980 23:00	12	0.90	0.50	<2-mo
5/23/1980 12:00	1	0.10	0.10	<2-mo
5/24/1980 6:00	1	0.10	0.10	<2-mo
5/30/1980 17:00	5	0.20	0.10	<2-mo
5/31/1980 12:00	1	0.10	0.10	<2-mo
6/1/1980 10:00	4	0.40	0.20	<2-mo
6/2/1980 9:00	13	1.40	0.90	4-mo, 13-hr
6/6/1980 8:00	2	0.20	0.10	<2-mo
6/7/1980 21:00	1	0.10	0.10	<2-mo
6/9/1980 17:00	8	0.40	0.10	<2-mo
6/15/1980 11:00	15	0.70	0.20	<2-mo
6/19/1980 19:00	1	0.20	0.20	<2-mo
6/20/1980 10:00	1	0.10	0.10	<2-mo
6/24/1980 1:00	1	0.10	0.10	<2-mo
6/24/1980 13:00	1	0.10	0.10	<2-mo
6/28/1980 22:00	10	0.50	0.20	<2-mo
7/5/1980 10:00	2	0.20	0.10	<2-mo
7/8/1980 17:00	1	0.10	0.10	<2-mo
7/9/1980 9:00	7	0.80	0.50	<2-mo
7/12/1980 15:00	7	0.70	0.30	<2-mo
7/13/1980 11:00	1	0.10	0.10	<2-mo
7/21/1980 20:00	23	3.10	1.40	5-yr, 23-hr
7/24/1980 12:00	1	0.10	0.10	<2-mo
7/27/1980 14:00	29	3.80	1.10	10-yr, 29-hr
8/1/1980 10:00	1	0.10	0.10	<2-mo
8/2/1980 23:00	11	0.60	0.20	<2-mo
8/3/1980 21:00	3	0.30	0.10	<2-mo
8/5/1980 15:00	3	0.20	0.10	<2-mo
8/7/1980 10:00	3	1.00	0.40	4-mo, 3-hr
8/9/1980 15:00	13	0.50	0.20	<2-mo
8/11/1980 3:00	20	2.30	0.80	1.5-yr, 20-hr
8/12/1980 15:00	1	0.10	0.10	<2-mo
8/15/1980 0:00	12	0.50	0.10	<2-mo
8/17/1980 15:00	8	0.60	0.20	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event Date/Time	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
8/19/1980 0:00	8	0.40	0.20	<2-mo
8/20/1980 9:00	14	1.20	0.40	3-mo, 14-hr
8/21/1980 18:00	1	0.40	0.40	<2-mo
8/29/1980 22:00	1	0.10	0.10	<2-mo
8/31/1980 8:00	1	0.10	0.10	<2-mo
9/4/1980 14:00	5	0.80	0.60	<2-mo
9/9/1980 14:00	7	1.10	0.70	3-mo, 7-hr
9/23/1980 13:00	1	0.10	0.10	<2-mo
10/4/1980 10:00	1	0.10	0.10	<2-mo
10/18/1980 1:00	6	0.70	0.30	<2-mo
10/24/1980 22:00	10	0.60	0.10	<2-mo
10/27/1980 22:00	10	0.20	0.10	<2-mo
11/4/1980 2:00	2	0.20	0.10	<2-mo
11/17/1980 14:00	5	0.80	0.50	<2-mo
11/18/1980 11:00	1	0.10	0.10	<2-mo
11/23/1980 21:00	16	0.30	0.10	<2-mo
11/27/1980 6:00	7	0.80	0.30	<2-mo
12/1/1980 16:00	1	0.10	0.10	<2-mo
12/5/1980 7:00	7	0.20	0.10	<2-mo
12/6/1980 13:00	1	0.10	0.10	<2-mo
12/8/1980 18:00	19	0.50	0.10	<2-mo
12/12/1980 5:00	1	0.10	0.10	<2-mo
12/15/1980 21:00	1	0.10	0.10	<2-mo
12/24/1980 10:00	2	0.20	0.10	<2-mo
12/29/1980 13:00	9	0.20	0.10	<2-mo
12/31/1980 15:00	1	0.10	0.10	<2-mo
2/1/1981 9:00	17	1.60	0.20	5.5-mo, 17-hr
2/10/1981 10:00	8	0.30	0.10	<2-mo
2/11/1981 7:00	1	0.10	0.10	<2-mo
2/13/1981 10:00	1	0.10	0.10	<2-mo
2/16/1981 12:00	4	0.40	0.20	<2-mo
2/19/1981 2:00	22	0.90	0.10	<2-mo
2/20/1981 14:00	1	0.10	0.10	<2-mo
2/23/1981 3:00	12	0.30	0.10	<2-mo
2/28/1981 7:00	5	0.20	0.10	<2-mo
3/4/1981 14:00	21	0.70	0.20	<2-mo
3/9/1981 13:00	1	0.10	0.10	<2-mo
3/15/1981 23:00	5	0.40	0.20	<2-mo
3/20/1981 11:00	1	0.10	0.10	<2-mo
3/26/1981 20:00	9	0.40	0.10	<2-mo
3/30/1981 1:00	5	0.30	0.10	<2-mo
4/3/1981 19:00	1	0.10	0.10	<2-mo
4/4/1981 13:00	13	1.70	0.30	8.5-mo, 13-hr
4/11/1981 6:00	1	0.10	0.10	<2-mo
4/11/1981 20:00	12	1.10	0.30	2-mo, 12-hr
4/12/1981 19:00	1	0.10	0.10	<2-mo
4/17/1981 5:00	3	0.30	0.10	<2-mo
4/18/1981 3:00	2	0.20	0.10	<2-mo
4/19/1981 20:00	2	0.20	0.10	<2-mo
4/22/1981 19:00	11	0.90	0.20	<2-mo
4/26/1981 15:00	1	0.10	0.10	<2-mo
4/29/1981 0:00	5	0.20	0.10	<2-mo
5/1/1981 4:00	4	0.80	0.30	2-mo, 4-hr
5/5/1981 19:00	17	0.70	0.20	<2-mo
5/10/1981 21:00	19	1.50	0.30	4-mo, 19-hr
5/12/1981 9:00	1	0.10	0.10	<2-mo
5/14/1981 16:00	5	1.10	0.40	4-mo, 5-hr
5/18/1981 11:00	14	0.40	0.10	<2-mo
5/26/1981 18:00	37	1.00	0.20	<2-mo
5/30/1981 7:00	11	0.80	0.50	<2-mo
5/31/1981 7:00	1	0.10	0.10	<2-mo
6/3/1981 8:00	5	0.40	0.20	<2-mo
6/5/1981 16:00	12	2.00	0.80	1-yr, 12-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
6/8/1981 19:00	34	1.50	0.40	4-mo, 34-hr
6/13/1981 6:00	16	3.50	1.30	10-yr, 16-hr
6/16/1981 16:00	1	0.30	0.30	<2-mo
6/21/1981 14:00	2	0.60	0.50	<2-mo
6/22/1981 10:00	1	0.10	0.10	<2-mo
6/30/1981 21:00	3	0.60	0.50	<2-mo
7/1/1981 13:00	8	0.20	0.10	<2-mo
7/2/1981 12:00	1	0.10	0.10	<2-mo
7/13/1981 20:00	2	0.70	0.60	2-mo, 2-hr
7/19/1981 17:00	18	0.40	0.10	<2-mo
7/20/1981 23:00	1	0.10	0.10	<2-mo
7/26/1981 7:00	9	0.20	0.10	<2-mo
7/31/1981 15:00	1	0.10	0.10	<2-mo
8/1/1981 12:00	1	0.10	0.10	<2-mo
8/2/1981 18:00	1	0.10	0.10	<2-mo
8/3/1981 14:00	1	0.10	0.10	<2-mo
8/5/1981 21:00	19	0.50	0.10	<2-mo
8/29/1981 17:00	1	0.10	0.10	<2-mo
9/2/1981 17:00	21	1.00	0.40	<2-mo
9/7/1981 12:00	1	0.10	0.10	<2-mo
9/8/1981 4:00	3	0.20	0.10	<2-mo
9/14/1981 20:00	1	0.40	0.40	<2-mo
9/18/1981 11:00	1	0.10	0.10	<2-mo
9/30/1981 11:00	1	0.20	0.20	<2-mo
10/6/1981 6:00	3	0.20	0.10	<2-mo
10/18/1981 2:00	7	0.30	0.20	<2-mo
10/22/1981 19:00	12	0.60	0.10	<2-mo
10/26/1981 2:00	11	0.20	0.10	<2-mo
11/5/1981 8:00	2	0.40	0.30	<2-mo
11/9/1981 9:00	8	0.50	0.20	<2-mo
11/19/1981 15:00	11	1.20	0.40	3-mo, 11-hr
11/24/1981 1:00	8	0.50	0.10	<2-mo
12/1/1981 2:00	10	0.60	0.20	<2-mo
12/4/1981 6:00	4	0.20	0.10	<2-mo
12/17/1981 12:00	3	0.30	0.20	<2-mo
12/21/1981 11:00	7	0.30	0.10	<2-mo
12/22/1981 6:00	23	0.50	0.10	<2-mo
12/27/1981 10:00	1	0.10	0.10	<2-mo
12/28/1981 15:00	1	0.10	0.10	<2-mo
12/31/1981 14:00	9	0.30	0.10	<2-mo
1/3/1982 16:00	10	0.50	0.30	<2-mo
1/6/1982 19:00	1	0.10	0.10	<2-mo
1/12/1982 11:00	1	0.10	0.10	<2-mo
1/13/1982 6:00	5	0.20	0.10	<2-mo
1/16/1982 5:00	1	0.10	0.10	<2-mo
1/21/1982 1:00	1	0.10	0.10	<2-mo
1/22/1982 16:00	18	1.50	0.20	5-mo, 18-hr
1/25/1982 14:00	1	0.10	0.10	<2-mo
1/26/1982 16:00	1	0.10	0.10	<2-mo
1/30/1982 6:00	35	1.80	0.20	5.5-mo, 35-hr
2/3/1982 11:00	5	0.20	0.10	<2-mo
2/8/1982 23:00	5	0.50	0.20	<2-mo
2/14/1982 15:00	1	0.10	0.10	<2-mo
2/15/1982 19:00	1	0.10	0.10	<2-mo
2/16/1982 17:00	23	0.50	0.10	<2-mo
2/19/1982 1:00	1	0.10	0.10	<2-mo
2/23/1982 12:00	1	0.10	0.10	<2-mo
3/2/1982 20:00	5	0.30	0.10	<2-mo
3/4/1982 6:00	15	0.50	0.10	<2-mo
3/11/1982 10:00	7	0.80	0.30	<2-mo
3/13/1982 4:00	3	0.30	0.10	<2-mo
3/15/1982 5:00	5	0.20	0.10	<2-mo
3/16/1982 6:00	4	0.30	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
3/19/1982 14:00	32	1.20	0.30	2-mo, 32-hr
3/25/1982 10:00	11	0.20	0.10	<2-mo
3/30/1982 21:00	7	0.50	0.20	<2-mo
4/3/1982 1:00	9	0.60	0.20	<2-mo
4/5/1982 21:00	4	0.20	0.10	<2-mo
4/9/1982 13:00	2	0.20	0.10	<2-mo
4/15/1982 14:00	1	0.10	0.10	<2-mo
4/16/1982 18:00	14	0.30	0.10	<2-mo
4/20/1982 11:00	1	0.10	0.10	<2-mo
4/27/1982 11:00	1	0.10	0.10	<2-mo
5/7/1982 17:00	22	0.80	0.20	<2-mo
5/19/1982 18:00	10	0.60	0.40	<2-mo
5/20/1982 17:00	1	0.10	0.10	<2-mo
5/21/1982 17:00	17	0.80	0.20	<2-mo
5/28/1982 0:00	3	0.20	0.10	<2-mo
5/29/1982 14:00	12	0.50	0.30	<2-mo
6/1/1982 15:00	1	0.10	0.10	<2-mo
6/4/1982 21:00	9	0.60	0.30	<2-mo
6/9/1982 19:00	3	0.40	0.20	<2-mo
6/12/1982 13:00	1	0.10	0.10	<2-mo
6/15/1982 23:00	10	0.70	0.20	<2-mo
6/16/1982 21:00	1	0.10	0.10	<2-mo
6/22/1982 17:00	2	0.20	0.10	<2-mo
6/28/1982 19:00	1	0.20	0.20	<2-mo
6/29/1982 9:00	1	0.10	0.10	<2-mo
7/3/1982 6:00	2	0.20	0.10	<2-mo
7/4/1982 7:00	12	0.40	0.20	<2-mo
7/8/1982 12:00	1	0.30	0.30	<2-mo
7/9/1982 13:00	1	0.10	0.10	<2-mo
7/19/1982 5:00	1	0.10	0.10	<2-mo
7/27/1982 17:00	1	0.10	0.10	<2-mo
10/7/1982 18:00	6	0.30	0.10	<2-mo
10/9/1982 3:00	15	0.80	0.40	<2-mo
10/29/1982 17:00	1	0.10	0.10	<2-mo
10/31/1982 1:00	1	0.10	0.10	<2-mo
10/31/1982 14:00	1	0.10	0.10	<2-mo
1/10/1983 15:00	3	0.30	0.10	<2-mo
1/19/1983 17:00	1	0.10	0.10	<2-mo
1/22/1983 3:00	8	0.40	0.10	<2-mo
1/23/1983 14:00	1	0.10	0.10	<2-mo
1/30/1983 2:00	8	0.30	0.10	<2-mo
2/2/1983 1:00	13	0.70	0.10	<2-mo
2/6/1983 6:00	1	0.10	0.10	<2-mo
2/7/1983 2:00	1	0.10	0.10	<2-mo
2/11/1983 6:00	16	0.40	0.10	<2-mo
2/24/1983 22:00	1	0.10	0.10	<2-mo
3/6/1983 7:00	1	0.10	0.10	<2-mo
3/10/1983 23:00	10	0.40	0.10	<2-mo
3/18/1983 12:00	1	0.10	0.10	<2-mo
3/19/1983 2:00	1	0.10	0.10	<2-mo
3/20/1983 22:00	1	0.10	0.10	<2-mo
3/27/1983 7:00	1	0.10	0.10	<2-mo
3/28/1983 10:00	1	0.10	0.10	<2-mo
4/1/1983 23:00	1	0.10	0.10	<2-mo
4/2/1983 16:00	12	0.70	0.30	<2-mo
4/6/1983 8:00	2	0.30	0.20	<2-mo
4/7/1983 3:00	1	0.10	0.10	<2-mo
4/8/1983 3:00	15	1.10	0.30	2-mo, 15-hr
4/9/1983 7:00	13	0.50	0.30	<2-mo
4/12/1983 14:00	1	0.10	0.10	<2-mo
4/13/1983 11:00	5	0.20	0.10	<2-mo
4/14/1983 16:00	6	0.60	0.20	<2-mo
4/24/1983 0:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
4/25/1983 10:00	1	0.10	0.10	<2-mo
4/28/1983 21:00	1	0.20	0.20	<2-mo
4/29/1983 16:00	19	1.30	0.50	3-mo, 19-hr
4/30/1983 23:00	34	1.30	0.20	2-mo, 34-hr
5/2/1983 23:00	26	1.50	0.30	4-mo, 26-hr
5/6/1983 15:00	1	0.10	0.10	<2-mo
5/14/1983 21:00	21	0.90	0.20	<2-mo
5/16/1983 15:00	1	0.10	0.10	<2-mo
5/19/1983 5:00	5	0.50	0.10	<2-mo
5/21/1983 9:00	1	0.10	0.10	<2-mo
5/22/1983 1:00	12	2.20	1.10	1.5-yr, 12-hr
5/25/1983 18:00	1	0.10	0.10	<2-mo
5/28/1983 19:00	1	0.10	0.10	<2-mo
5/29/1983 12:00	6	0.30	0.10	<2-mo
6/3/1983 10:00	8	0.40	0.20	<2-mo
6/5/1983 17:00	1	0.10	0.10	<2-mo
6/9/1983 11:00	1	0.20	0.20	<2-mo
6/17/1983 6:00	11	1.90	1.00	1-yr, 11-hr
6/18/1983 21:00	1	0.10	0.10	<2-mo
6/19/1983 13:00	1	0.20	0.20	<2-mo
6/27/1983 17:00	1	0.10	0.10	<2-mo
6/28/1983 18:00	1	0.30	0.30	<2-mo
6/29/1983 11:00	1	0.10	0.10	<2-mo
6/30/1983 16:00	2	0.80	0.50	3-mo, 2-hr
7/2/1983 12:00	1	0.10	0.10	<2-mo
7/3/1983 15:00	4	0.40	0.30	<2-mo
7/4/1983 17:00	4	0.50	0.30	<2-mo
7/17/1983 14:00	18	1.70	0.80	6-mo, 18-hr
7/18/1983 19:00	1	1.00	1.00	11-mo, 1-hr
7/19/1983 13:00	1	0.10	0.10	<2-mo
7/23/1983 16:00	10	0.30	0.20	<2-mo
8/11/1983 10:00	1	0.20	0.20	<2-mo
8/20/1983 15:00	1	0.10	0.10	<2-mo
8/22/1983 16:00	1	0.20	0.20	<2-mo
8/23/1983 4:00	9	0.60	0.50	<2-mo
8/27/1983 18:00	1	0.10	0.10	<2-mo
8/28/1983 15:00	1	0.10	0.10	<2-mo
9/5/1983 13:00	1	0.30	0.30	<2-mo
9/6/1983 12:00	1	0.10	0.10	<2-mo
9/12/1983 15:00	11	0.40	0.20	<2-mo
9/16/1983 14:00	7	0.60	0.30	<2-mo
9/21/1983 2:00	6	0.60	0.30	<2-mo
10/4/1983 12:00	3	0.70	0.30	<2-mo
10/5/1983 4:00	3	0.20	0.10	<2-mo
10/11/1983 18:00	2	0.20	0.10	<2-mo
10/12/1983 18:00	1	0.10	0.10	<2-mo
10/13/1983 10:00	7	0.30	0.10	<2-mo
10/18/1983 5:00	13	0.70	0.10	<2-mo
10/20/1983 10:00	19	1.10	0.10	<2-mo
10/22/1983 4:00	24	1.50	0.20	4-mo, 24-hr
10/23/1983 17:00	12	0.20	0.10	<2-mo
11/2/1983 16:00	7	0.60	0.20	<2-mo
11/3/1983 12:00	1	0.10	0.10	<2-mo
11/10/1983 10:00	12	0.90	0.30	<2-mo
11/11/1983 12:00	1	0.10	0.10	<2-mo
11/15/1983 4:00	11	0.40	0.10	<2-mo
11/16/1983 12:00	1	0.10	0.10	<2-mo
11/19/1983 12:00	1	0.10	0.10	<2-mo
11/20/1983 15:00	3	0.20	0.10	<2-mo
11/23/1983 13:00	3	0.30	0.10	<2-mo
11/27/1983 20:00	13	1.30	0.30	4-mo, 13-hr
12/2/1983 18:00	1	0.20	0.20	<2-mo
12/3/1983 23:00	10	1.00	0.20	2-mo, 10-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
12/6/1983 7:00	7	0.40	0.20	<2-mo
12/9/1983 12:00	1	0.10	0.10	<2-mo
12/11/1983 17:00	1	0.20	0.20	<2-mo
12/12/1983 22:00	1	0.10	0.10	<2-mo
12/21/1983 17:00	14	0.70	0.20	<2-mo
12/28/1983 8:00	7	0.60	0.20	<2-mo
1/1/1984 20:00	1	0.10	0.10	<2-mo
1/10/1984 8:00	1	0.20	0.20	<2-mo
1/17/1984 2:00	1	0.10	0.10	<2-mo
1/18/1984 18:00	1	0.10	0.10	<2-mo
1/24/1984 0:00	6	0.40	0.10	<2-mo
1/29/1984 7:00	1	0.10	0.10	<2-mo
1/30/1984 12:00	1	0.10	0.10	<2-mo
2/3/1984 12:00	1	0.10	0.10	<2-mo
2/4/1984 12:00	1	0.10	0.10	<2-mo
2/10/1984 14:00	1	0.10	0.10	<2-mo
2/11/1984 5:00	1	0.10	0.10	<2-mo
2/13/1984 19:00	5	0.60	0.20	<2-mo
2/16/1984 11:00	1	0.10	0.10	<2-mo
2/18/1984 13:00	1	0.10	0.10	<2-mo
2/25/1984 1:00	10	0.20	0.10	<2-mo
2/27/1984 21:00	23	1.10	0.20	<2-mo
2/29/1984 13:00	1	0.10	0.10	<2-mo
3/1/1984 14:00	1	0.10	0.10	<2-mo
3/5/1984 6:00	10	0.20	0.10	<2-mo
3/8/1984 10:00	1	0.20	0.20	<2-mo
3/9/1984 7:00	1	0.10	0.10	<2-mo
3/12/1984 22:00	1	0.10	0.10	<2-mo
4/13/1984 12:00	1	0.10	0.10	<2-mo
4/14/1984 13:00	1	0.10	0.10	<2-mo
4/16/1984 23:00	9	0.40	0.20	<2-mo
4/18/1984 7:00	14	0.40	0.10	<2-mo
4/19/1984 21:00	1	0.10	0.10	<2-mo
4/22/1984 7:00	9	1.30	0.40	4-mo, 9-hr
4/23/1984 16:00	6	0.20	0.10	<2-mo
4/25/1984 14:00	1	0.10	0.10	<2-mo
4/27/1984 14:00	1	0.10	0.10	<2-mo
5/3/1984 12:00	9	0.90	0.30	<2-mo
5/6/1984 6:00	3	0.30	0.10	<2-mo
5/8/1984 6:00	5	0.30	0.10	<2-mo
5/10/1984 13:00	1	0.10	0.10	<2-mo
5/12/1984 3:00	1	0.10	0.10	<2-mo
5/12/1984 17:00	1	0.10	0.10	<2-mo
5/20/1984 21:00	2	0.30	0.20	<2-mo
5/22/1984 19:00	22	1.00	0.20	<2-mo
5/27/1984 14:00	1	0.10	0.10	<2-mo
5/28/1984 11:00	9	1.30	0.50	4-mo, 9-hr
6/23/1984 18:00	1	0.70	0.70	4-mo, 1-hr
6/24/1984 7:00	1	0.30	0.30	<2-mo
6/26/1984 18:00	1	0.10	0.10	<2-mo
7/1/1984 4:00	5	0.20	0.10	<2-mo
7/5/1984 16:00	1	0.10	0.10	<2-mo
7/6/1984 16:00	1	0.20	0.20	<2-mo
7/9/1984 21:00	1	0.10	0.10	<2-mo
7/11/1984 15:00	1	0.10	0.10	<2-mo
7/12/1984 13:00	1	0.10	0.10	<2-mo
7/15/1984 16:00	3	0.70	0.50	<2-mo
7/25/1984 7:00	8	0.20	0.10	<2-mo
7/26/1984 20:00	1	0.10	0.10	<2-mo
7/31/1984 17:00	1	0.10	0.10	<2-mo
8/4/1984 19:00	1	0.10	0.10	<2-mo
8/5/1984 15:00	1	0.10	0.10	<2-mo
9/14/1984 15:00	1	3.00	3.00	>100-yr, 1-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
10/8/1984 4:00	10	0.60	0.10	<2-mo
10/9/1984 16:00	1	0.10	0.10	<2-mo
10/15/1984 20:00	16	0.40	0.10	<2-mo
10/21/1984 10:00	2	0.20	0.10	<2-mo
10/22/1984 1:00	13	0.80	0.20	<2-mo
10/25/1984 12:00	1	0.30	0.30	<2-mo
10/28/1984 16:00	10	0.50	0.10	<2-mo
11/1/1984 10:00	11	0.80	0.20	<2-mo
11/4/1984 8:00	10	0.40	0.20	<2-mo
11/9/1984 3:00	42	1.20	0.20	2-mo, 42-hr
11/18/1984 14:00	7	0.30	0.20	<2-mo
11/19/1984 11:00	1	0.10	0.10	<2-mo
11/28/1984 5:00	6	0.50	0.10	<2-mo
12/3/1984 5:00	1	0.10	0.10	<2-mo
12/5/1984 22:00	6	0.60	0.20	<2-mo
12/8/1984 16:00	1	0.10	0.10	<2-mo
12/10/1984 7:00	5	0.40	0.20	<2-mo
12/12/1984 14:00	1	0.10	0.10	<2-mo
12/13/1984 8:00	12	0.40	0.10	<2-mo
12/14/1984 8:00	1	0.10	0.10	<2-mo
12/19/1984 7:00	10	0.70	0.30	<2-mo
12/26/1984 9:00	10	0.60	0.10	<2-mo
12/28/1984 14:00	1	0.10	0.10	<2-mo
1/10/1985 10:00	1	0.10	0.10	<2-mo
1/11/1985 1:00	1	0.10	0.10	<2-mo
1/17/1985 4:00	2	0.30	0.20	<2-mo
1/24/1985 17:00	1	0.10	0.10	<2-mo
1/31/1985 4:00	1	0.20	0.20	<2-mo
2/1/1985 10:00	5	0.30	0.20	<2-mo
2/3/1985 14:00	1	0.20	0.20	<2-mo
2/11/1985 2:00	1	0.10	0.10	<2-mo
2/11/1985 18:00	30	1.20	0.20	2-mo, 30-hr
2/14/1985 16:00	1	0.10	0.10	<2-mo
2/16/1985 17:00	1	0.10	0.10	<2-mo
2/22/1985 18:00	4	0.30	0.10	<2-mo
3/4/1985 20:00	2	0.40	0.20	<2-mo
3/7/1985 19:00	9	0.30	0.10	<2-mo
3/11/1985 9:00	15	0.70	0.20	<2-mo
3/22/1985 14:00	5	0.20	0.10	<2-mo
3/23/1985 14:00	1	0.10	0.10	<2-mo
3/26/1985 15:00	1	0.10	0.10	<2-mo
3/29/1985 19:00	40	3.70	0.70	5-yr, 40-hr
5/6/1985 17:00	1	0.10	0.10	<2-mo
5/15/1985 10:00	9	0.80	0.40	<2-mo
5/16/1985 18:00	3	0.40	0.20	<2-mo
5/18/1985 14:00	5	0.50	0.20	<2-mo
5/22/1985 17:00	1	0.10	0.10	<2-mo
5/27/1985 23:00	1	0.20	0.20	<2-mo
5/28/1985 12:00	1	0.10	0.10	<2-mo
5/30/1985 19:00	1	0.10	0.10	<2-mo
6/6/1985 4:00	1	0.10	0.10	<2-mo
6/23/1985 8:00	1	1.80	1.80	10-yr, 1-hr
7/2/1985 9:00	9	0.70	0.30	<2-mo
7/3/1985 11:00	1	0.10	0.10	<2-mo
7/5/1985 16:00	23	1.20	0.40	2-mo, 23-hr
7/7/1985 17:00	3	0.30	0.20	<2-mo
7/11/1985 14:00	1	0.10	0.10	<2-mo
7/15/1985 1:00	8	4.50	1.10	>100-yr, 8-hr
7/17/1985 16:00	1	0.10	0.10	<2-mo
7/21/1985 19:00	5	0.70	0.20	<2-mo
7/26/1985 16:00	1	0.50	0.50	<2-mo
7/30/1985 17:00	1	0.10	0.10	<2-mo
9/24/1985 2:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event Date/Time	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
9/24/1985 20:00	1	0.10	0.10	<2-mo
9/26/1985 14:00	1	0.20	0.20	<2-mo
9/30/1985 22:00	2	0.40	0.30	<2-mo
10/1/1985 17:00	1	0.10	0.10	<2-mo
10/7/1985 16:00	1	0.10	0.10	<2-mo
10/14/1985 10:00	1	0.10	0.10	<2-mo
10/19/1985 14:00	28	1.40	0.40	3-mo, 28-hr
10/23/1985 14:00	1	0.10	0.10	<2-mo
10/24/1985 5:00	12	0.40	0.20	<2-mo
10/31/1985 12:00	1	0.10	0.10	<2-mo
11/2/1985 13:00	48	1.50	0.20	3-mo, 48-hr
11/5/1985 1:00	13	0.60	0.20	<2-mo
11/7/1985 12:00	1	0.10	0.10	<2-mo
11/9/1985 14:00	4	0.30	0.10	<2-mo
11/10/1985 10:00	19	1.60	0.40	5-mo, 19-hr
11/12/1985 5:00	3	0.30	0.20	<2-mo
11/13/1985 3:00	1	0.10	0.10	<2-mo
11/14/1985 1:00	8	0.20	0.10	<2-mo
11/15/1985 12:00	19	2.40	0.30	1.5-yr, 19-hr
11/24/1985 6:00	1	0.10	0.10	<2-mo
11/25/1985 4:00	1	0.20	0.20	<2-mo
11/26/1985 3:00	8	1.30	0.50	5-mo, 8-hr
11/26/1985 23:00	18	1.20	0.20	2-mo, 18-hr
1/18/1986 0:00	1	0.20	0.20	<2-mo
1/19/1986 4:00	21	1.20	0.30	2-mo, 21-hr
1/30/1986 20:00	1	0.10	0.10	<2-mo
4/6/1986 12:00	1	0.20	0.20	<2-mo
4/9/1986 16:00	1	0.10	0.10	<2-mo
4/15/1986 0:00	1	0.20	0.20	<2-mo
4/18/1986 11:00	1	0.10	0.10	<2-mo
4/20/1986 10:00	13	0.50	0.10	<2-mo
4/21/1986 16:00	1	0.20	0.20	<2-mo
4/24/1986 15:00	1	0.10	0.10	<2-mo
5/6/1986 22:00	1	0.30	0.30	<2-mo
5/13/1986 12:00	2	0.20	0.10	<2-mo
5/14/1986 7:00	10	0.20	0.10	<2-mo
5/23/1986 16:00	1	0.10	0.10	<2-mo
5/26/1986 19:00	8	0.70	0.30	<2-mo
5/28/1986 17:00	1	0.10	0.10	<2-mo
5/30/1986 2:00	1	0.40	0.40	<2-mo
6/2/1986 1:00	1	0.10	0.10	<2-mo
6/7/1986 15:00	1	0.10	0.10	<2-mo
6/10/1986 16:00	1	0.10	0.10	<2-mo
6/11/1986 22:00	14	0.90	0.40	<2-mo
6/16/1986 21:00	1	0.20	0.20	<2-mo
6/20/1986 4:00	2	0.50	0.40	<2-mo
6/26/1986 14:00	1	0.10	0.10	<2-mo
6/28/1986 1:00	18	1.50	0.30	5-mo, 18-hr
6/30/1986 12:00	1	0.30	0.30	<2-mo
7/1/1986 7:00	1	0.10	0.10	<2-mo
7/1/1986 19:00	5	0.50	0.20	<2-mo
7/2/1986 11:00	1	0.10	0.10	<2-mo
7/3/1986 17:00	1	0.10	0.10	<2-mo
7/9/1986 9:00	3	0.40	0.30	<2-mo
7/11/1986 4:00	1	0.20	0.20	<2-mo
7/11/1986 21:00	2	0.60	0.50	<2-mo
7/12/1986 15:00	2	0.30	0.20	<2-mo
7/14/1986 5:00	12	0.30	0.20	<2-mo
7/24/1986 1:00	1	0.20	0.20	<2-mo
7/25/1986 22:00	1	0.50	0.50	<2-mo
7/27/1986 6:00	1	0.10	0.10	<2-mo
8/10/1986 11:00	3	0.40	0.20	<2-mo
8/11/1986 18:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
8/17/1986 3:00	1	0.20	0.20	<2-mo
8/17/1986 20:00	1	0.10	0.10	<2-mo
8/23/1986 16:00	2	0.30	0.20	<2-mo
8/27/1986 0:00	3	0.60	0.30	<2-mo
8/29/1986 17:00	1	0.10	0.10	<2-mo
9/4/1986 5:00	16	0.90	0.50	<2-mo
10/1/1986 0:00	1	4.50	4.50	>100-yr, 1-hr
10/3/1986 13:00	1	0.80	0.80	5-mo, 1-hr
11/20/1986 16:00	1	0.30	0.30	<2-mo
11/26/1986 2:00	18	1.10	0.40	<2-mo
12/1/1986 19:00	20	2.10	0.30	1-yr, 20-hr
12/3/1986 4:00	1	0.10	0.10	<2-mo
12/8/1986 23:00	9	0.40	0.20	<2-mo
12/16/1986 21:00	1	0.10	0.10	<2-mo
12/24/1986 6:00	14	0.60	0.20	<2-mo
1/1/1987 14:00	1	0.20	0.20	<2-mo
2/16/1987 3:00	1	0.20	0.20	<2-mo
2/18/1987 13:00	1	0.20	0.20	<2-mo
2/28/1987 13:00	5	0.50	0.20	<2-mo
3/1/1987 8:00	1	0.20	0.20	<2-mo
3/27/1987 17:00	1	0.10	0.10	<2-mo
3/30/1987 4:00	27	1.20	0.20	2-mo, 27-hr
4/4/1987 2:00	22	1.70	0.20	6-mo, 22-hr
4/13/1987 8:00	8	1.30	1.00	5-mo, 8-hr
4/14/1987 7:00	8	0.20	0.10	<2-mo
4/18/1987 14:00	1	0.10	0.10	<2-mo
4/23/1987 9:00	2	0.20	0.10	<2-mo
4/24/1987 13:00	2	0.20	0.10	<2-mo
4/26/1987 18:00	1	0.10	0.10	<2-mo
5/3/1987 10:00	4	0.60	0.20	<2-mo
5/15/1987 1:00	3	0.90	0.50	3-mo, 3-hr
6/3/1987 16:00	1	0.10	0.10	<2-mo
6/12/1987 7:00	5	0.50	0.30	<2-mo
6/15/1987 8:00	1	0.20	0.20	<2-mo
6/21/1987 18:00	1	0.50	0.50	<2-mo
6/22/1987 12:00	10	0.60	0.30	<2-mo
6/27/1987 14:00	1	0.20	0.20	<2-mo
7/1/1987 8:00	18	1.00	0.30	<2-mo
7/5/1987 16:00	1	0.10	0.10	<2-mo
7/6/1987 8:00	5	0.20	0.10	<2-mo
7/10/1987 14:00	1	0.10	0.10	<2-mo
7/14/1987 14:00	1	0.10	0.10	<2-mo
7/22/1987 15:00	1	0.20	0.20	<2-mo
7/26/1987 12:00	1	0.60	0.60	3-mo, 1-hr
8/2/1987 23:00	3	0.40	0.20	<2-mo
8/5/1987 5:00	2	0.20	0.10	<2-mo
8/21/1987 15:00	1	0.20	0.20	<2-mo
8/28/1987 8:00	6	0.50	0.30	<2-mo
9/12/1987 17:00	2	1.10	0.80	8-mo, 2-hr
9/22/1987 9:00	1	0.20	0.20	<2-mo
9/29/1987 15:00	6	0.50	0.20	<2-mo
10/6/1987 11:00	12	0.50	0.20	<2-mo
10/7/1987 20:00	1	0.30	0.30	<2-mo
10/10/1987 16:00	11	0.40	0.10	<2-mo
10/23/1987 12:00	1	0.10	0.10	<2-mo
10/24/1987 19:00	1	0.10	0.10	<2-mo
10/27/1987 8:00	1	0.10	0.10	<2-mo
10/30/1987 16:00	1	0.10	0.10	<2-mo
11/9/1987 6:00	1	0.10	0.10	<2-mo
11/12/1987 14:00	1	0.10	0.10	<2-mo
11/17/1987 12:00	1	0.10	0.10	<2-mo
11/23/1987 13:00	1	0.10	0.10	<2-mo
11/24/1987 18:00	5	0.40	0.20	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
11/27/1987 14:00	1	0.20	0.20	<2-mo
11/29/1987 0:00	2	0.20	0.10	<2-mo
12/2/1987 8:00	1	0.10	0.10	<2-mo
12/3/1987 12:00	10	0.70	0.30	<2-mo
12/7/1987 16:00	1	0.10	0.10	<2-mo
12/9/1987 5:00	1	0.10	0.10	<2-mo
12/11/1987 19:00	1	0.30	0.30	<2-mo
12/14/1987 23:00	10	0.30	0.20	<2-mo
12/19/1987 21:00	1	0.10	0.10	<2-mo
1/1/1988 0:00	1	1.70	1.70	7-yr, 1-hr
1/17/1988 14:00	4	0.40	0.20	<2-mo
1/19/1988 16:00	7	1.30	0.40	5-mo, 7-hr
1/31/1988 20:00	41	2.40	0.40	1-yr, 41-hr
2/3/1988 20:00	8	0.70	0.20	<2-mo
2/10/1988 14:00	1	0.20	0.20	<2-mo
2/15/1988 1:00	2	0.40	0.20	<2-mo
2/19/1988 12:00	10	0.40	0.20	<2-mo
2/23/1988 6:00	3	0.20	0.10	<2-mo
4/12/1988 19:00	1	0.10	0.10	<2-mo
4/18/1988 5:00	4	0.30	0.10	<2-mo
4/22/1988 6:00	4	0.20	0.10	<2-mo
4/23/1988 16:00	1	0.10	0.10	<2-mo
4/29/1988 12:00	1	0.20	0.20	<2-mo
5/5/1988 5:00	12	0.50	0.20	<2-mo
5/7/1988 17:00	1	0.10	0.10	<2-mo
5/9/1988 18:00	1	0.20	0.20	<2-mo
5/13/1988 17:00	1	0.10	0.10	<2-mo
5/20/1988 10:00	1	0.20	0.20	<2-mo
5/23/1988 7:00	10	0.50	0.20	<2-mo
5/24/1988 12:00	3	0.20	0.10	<2-mo
6/2/1988 13:00	3	0.30	0.10	<2-mo
6/8/1988 12:00	17	0.50	0.20	<2-mo
6/17/1988 15:00	1	0.10	0.10	<2-mo
6/21/1988 20:00	1	0.20	0.20	<2-mo
6/22/1988 16:00	1	0.10	0.10	<2-mo
10/10/1988 21:00	1	0.20	0.20	<2-mo
10/21/1988 12:00	1	0.20	0.20	<2-mo
10/23/1988 17:00	1	0.20	0.20	<2-mo
10/28/1988 0:00	1	0.10	0.10	<2-mo
11/3/1988 21:00	5	0.50	0.30	<2-mo
11/5/1988 7:00	11	0.70	0.10	<2-mo
11/6/1988 16:00	1	0.10	0.10	<2-mo
11/7/1988 18:00	1	0.10	0.10	<2-mo
11/8/1988 13:00	1	0.10	0.10	<2-mo
11/10/1988 9:00	1	0.40	0.40	<2-mo
11/13/1988 7:00	1	0.10	0.10	<2-mo
11/14/1988 14:00	1	0.20	0.20	<2-mo
11/19/1988 1:00	1	0.10	0.10	<2-mo
11/19/1988 19:00	22	1.10	0.20	<2-mo
11/24/1988 14:00	1	0.10	0.10	<2-mo
11/27/1988 0:00	1	0.10	0.10	<2-mo
12/20/1988 14:00	1	0.10	0.10	<2-mo
12/21/1988 10:00	1	0.10	0.10	<2-mo
12/23/1988 3:00	13	0.30	0.10	<2-mo
12/24/1988 7:00	6	0.80	0.30	<2-mo
12/26/1988 15:00	1	0.10	0.10	<2-mo
12/28/1988 5:00	19	0.70	0.20	<2-mo
12/29/1988 11:00	1	0.10	0.10	<2-mo
1/5/1989 21:00	14	0.70	0.20	<2-mo
1/8/1989 2:00	1	0.10	0.10	<2-mo
1/9/1989 14:00	1	0.10	0.10	<2-mo
1/12/1989 4:00	4	0.30	0.10	<2-mo
1/14/1989 19:00	5	0.40	0.20	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
1/25/1989 16:00	1	0.10	0.10	<2-mo
1/26/1989 19:00	17	0.30	0.10	<2-mo
1/30/1989 16:00	1	0.10	0.10	<2-mo
2/17/1989 10:00	1	2.50	2.50	50-yr, 1-hr
2/20/1989 19:00	16	1.10	0.20	2-mo, 16-hr
2/26/1989 4:00	5	0.20	0.10	<2-mo
2/27/1989 15:00	1	0.10	0.10	<2-mo
3/5/1989 6:00	29	1.90	0.30	8-mo, 29-hr
3/15/1989 2:00	1	0.20	0.20	<2-mo
3/20/1989 9:00	17	1.10	0.20	2-mo, 17-hr
3/28/1989 11:00	1	0.10	0.10	<2-mo
3/29/1989 2:00	26	1.30	0.30	3-mo, 26-hr
3/31/1989 2:00	13	0.70	0.20	<2-mo
4/3/1989 0:00	2	0.20	0.10	<2-mo
4/4/1989 1:00	4	0.30	0.20	<2-mo
4/5/1989 11:00	1	0.10	0.10	<2-mo
4/8/1989 15:00	1	0.10	0.10	<2-mo
4/9/1989 12:00	1	0.10	0.10	<2-mo
4/13/1989 10:00	1	0.10	0.10	<2-mo
4/17/1989 19:00	6	0.90	0.30	2-mo, 6-hr
4/18/1989 17:00	6	0.60	0.20	<2-mo
4/25/1989 12:00	16	1.00	0.30	<2-mo
4/28/1989 9:00	2	0.40	0.30	<2-mo
4/28/1989 23:00	8	1.90	1.00	1-yr, 8-hr
5/1/1989 10:00	3	0.30	0.20	<2-mo
5/2/1989 5:00	11	0.20	0.10	<2-mo
5/3/1989 12:00	1	0.10	0.10	<2-mo
5/4/1989 22:00	2	0.30	0.20	<2-mo
5/6/1989 9:00	1	0.10	0.10	<2-mo
5/7/1989 16:00	1	0.10	0.10	<2-mo
5/9/1989 8:00	13	0.80	0.20	<2-mo
5/11/1989 3:00	1	0.10	0.10	<2-mo
5/12/1989 19:00	27	0.40	0.10	<2-mo
5/14/1989 21:00	23	0.60	0.20	<2-mo
5/20/1989 2:00	6	0.30	0.10	<2-mo
5/20/1989 19:00	1	0.10	0.10	<2-mo
5/23/1989 2:00	17	1.30	0.30	3-mo, 17-hr
5/24/1989 7:00	1	0.10	0.10	<2-mo
5/25/1989 10:00	25	2.30	0.60	1-yr, 25-hr
6/2/1989 1:00	6	0.20	0.10	<2-mo
6/3/1989 18:00	8	0.30	0.20	<2-mo
6/5/1989 8:00	4	0.40	0.10	<2-mo
6/9/1989 7:00	5	0.60	0.20	<2-mo
6/12/1989 10:00	10	0.70	0.30	<2-mo
6/14/1989 5:00	7	0.20	0.10	<2-mo
6/15/1989 4:00	7	0.60	0.20	<2-mo
6/19/1989 15:00	12	0.30	0.10	<2-mo
6/21/1989 3:00	8	0.20	0.10	<2-mo
6/22/1989 15:00	1	0.20	0.20	<2-mo
6/23/1989 15:00	1	0.10	0.10	<2-mo
6/27/1989 17:00	11	1.60	0.70	8.5-mo, 11-hr
6/30/1989 15:00	1	0.10	0.10	<2-mo
7/3/1989 6:00	17	0.80	0.20	<2-mo
7/7/1989 19:00	3	1.20	0.60	7-mo, 3-hr
7/11/1989 22:00	1	0.10	0.10	<2-mo
7/20/1989 7:00	1	0.10	0.10	<2-mo
7/21/1989 9:00	2	0.40	0.30	<2-mo
7/22/1989 15:00	1	0.10	0.10	<2-mo
7/26/1989 17:00	6	0.30	0.20	<2-mo
7/27/1989 17:00	10	0.80	0.40	<2-mo
7/29/1989 13:00	1	0.10	0.10	<2-mo
7/30/1989 13:00	12	0.60	0.40	<2-mo
8/4/1989 19:00	26	1.90	0.50	8-mo, 26-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
8/7/1989 16:00	1	0.10	0.10	<2-mo
8/18/1989 14:00	1	0.10	0.10	<2-mo
8/21/1989 5:00	1	0.10	0.10	<2-mo
8/22/1989 14:00	3	1.50	1.00	1-yr, 3-hr
8/23/1989 6:00	8	0.50	0.40	<2-mo
8/24/1989 3:00	2	0.60	0.50	<2-mo
8/26/1989 16:00	1	0.10	0.10	<2-mo
8/29/1989 21:00	2	1.10	0.90	8-mo, 2-hr
9/1/1989 11:00	3	0.20	0.10	<2-mo
9/10/1989 7:00	1	0.10	0.10	<2-mo
9/14/1989 11:00	8	0.80	0.30	<2-mo
9/20/1989 17:00	1	0.10	0.10	<2-mo
9/22/1989 13:00	21	1.90	0.60	9-mo, 21-hr
10/1/1989 8:00	8	0.40	0.20	<2-mo
10/2/1989 9:00	1	0.10	0.10	<2-mo
10/6/1989 18:00	1	0.10	0.10	<2-mo
10/8/1989 8:00	1	0.10	0.10	<2-mo
10/10/1989 11:00	3	0.40	0.20	<2-mo
10/16/1989 21:00	7	0.30	0.10	<2-mo
10/17/1989 22:00	1	0.20	0.20	<2-mo
10/19/1989 0:00	8	0.90	0.20	<2-mo
10/21/1989 12:00	1	0.10	0.10	<2-mo
10/31/1989 12:00	2	0.20	0.10	<2-mo
11/3/1989 1:00	1	0.10	0.10	<2-mo
11/7/1989 15:00	1	0.10	0.10	<2-mo
11/8/1989 21:00	1	0.10	0.10	<2-mo
11/11/1989 13:00	1	0.10	0.10	<2-mo
11/15/1989 19:00	4	0.80	0.50	2-mo, 4-hr
11/20/1989 1:00	1	0.10	0.10	<2-mo
11/27/1989 15:00	9	0.30	0.20	<2-mo
12/6/1989 17:00	1	0.10	0.10	<2-mo
12/8/1989 14:00	1	0.10	0.10	<2-mo
12/15/1989 9:00	5	0.40	0.20	<2-mo
12/18/1989 13:00	1	0.10	0.10	<2-mo
12/26/1989 4:00	1	0.10	0.10	<2-mo
12/28/1989 15:00	1	0.10	0.10	<2-mo
12/29/1989 19:00	11	0.60	0.30	<2-mo
12/30/1989 22:00	16	0.70	0.10	<2-mo
1/4/1990 7:00	1	0.10	0.10	<2-mo
1/11/1990 12:00	1	0.10	0.10	<2-mo
1/16/1990 15:00	1	0.10	0.10	<2-mo
1/17/1990 23:00	2	0.20	0.10	<2-mo
1/20/1990 2:00	14	0.70	0.20	<2-mo
1/25/1990 10:00	5	0.20	0.10	<2-mo
1/29/1990 8:00	13	0.80	0.20	<2-mo
2/1/1990 12:00	23	0.40	0.10	<2-mo
2/3/1990 12:00	25	0.90	0.10	<2-mo
2/7/1990 5:00	3	0.20	0.10	<2-mo
2/9/1990 11:00	15	0.50	0.10	<2-mo
2/11/1990 15:00	1	0.10	0.10	<2-mo
2/15/1990 4:00	21	1.00	0.20	<2-mo
5/3/1990 18:00	5	0.20	0.10	<2-mo
5/4/1990 10:00	14	1.40	0.50	4-mo, 14-hr
5/5/1990 16:00	3	0.20	0.10	<2-mo
5/10/1990 7:00	1	0.10	0.10	<2-mo
5/12/1990 18:00	18	0.80	0.20	<2-mo
5/15/1990 15:00	20	0.50	0.10	<2-mo
5/16/1990 23:00	9	1.20	0.60	4-mo, 9-hr
5/18/1990 14:00	1	0.10	0.10	<2-mo
5/20/1990 9:00	4	0.50	0.20	<2-mo
5/24/1990 14:00	1	0.10	0.10	<2-mo
5/25/1990 22:00	17	0.80	0.20	<2-mo
5/28/1990 13:00	19	2.80	0.30	3-yr, 19-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
6/3/1990 1:00	7	0.20	0.10	<2-mo
6/4/1990 2:00	1	0.10	0.10	<2-mo
6/6/1990 20:00	3	0.20	0.10	<2-mo
6/8/1990 6:00	2	1.70	1.30	3-yr, 2-hr
6/9/1990 4:00	6	0.40	0.30	<2-mo
6/14/1990 19:00	3	1.10	0.50	5.5-mo, 3-hr
6/22/1990 11:00	10	0.50	0.20	<2-mo
6/23/1990 17:00	1	0.10	0.10	<2-mo
7/5/1990 12:00	6	1.40	0.80	7-mo, 6-hr
7/9/1990 9:00	14	0.30	0.10	<2-mo
7/10/1990 21:00	24	1.00	0.40	<2-mo
7/12/1990 8:00	30	0.80	0.10	<2-mo
7/14/1990 3:00	4	0.80	0.60	2-mo, 4-hr
7/15/1990 1:00	1	0.10	0.10	<2-mo
7/20/1990 16:00	4	1.30	0.70	8-mo, 4-hr
7/22/1990 11:00	15	0.60	0.30	<2-mo
8/4/1990 21:00	10	0.30	0.10	<2-mo
8/9/1990 9:00	2	0.50	0.40	<2-mo
8/13/1990 11:00	4	0.50	0.30	<2-mo
8/18/1990 19:00	1	0.10	0.10	<2-mo
8/19/1990 18:00	1	0.50	0.50	<2-mo
8/21/1990 4:00	6	0.90	0.30	2-mo, 6-hr
8/29/1990 9:00	1	0.10	0.10	<2-mo
8/30/1990 12:00	1	0.10	0.10	<2-mo
9/5/1990 16:00	1	0.50	0.50	<2-mo
9/7/1990 10:00	1	0.10	0.10	<2-mo
9/12/1990 8:00	7	0.40	0.20	<2-mo
9/14/1990 17:00	2	0.60	0.40	<2-mo
9/19/1990 5:00	6	0.40	0.10	<2-mo
9/21/1990 21:00	9	0.40	0.20	<2-mo
9/29/1990 19:00	4	0.50	0.20	<2-mo
10/3/1990 14:00	1	0.10	0.10	<2-mo
10/4/1990 4:00	6	1.10	0.40	4-mo, 6-hr
10/9/1990 6:00	1	0.10	0.10	<2-mo
10/9/1990 19:00	1	0.10	0.10	<2-mo
10/11/1990 4:00	1	0.10	0.10	<2-mo
10/12/1990 7:00	21	0.60	0.10	<2-mo
10/18/1990 5:00	4	0.60	0.40	<2-mo
10/22/1990 7:00	19	0.90	0.10	<2-mo
11/5/1990 15:00	5	0.30	0.10	<2-mo
11/9/1990 23:00	9	0.40	0.20	<2-mo
11/16/1990 19:00	1	0.10	0.10	<2-mo
11/17/1990 12:00	1	0.10	0.10	<2-mo
11/22/1990 11:00	11	0.60	0.20	<2-mo
12/3/1990 2:00	18	1.30	0.20	3-mo, 18-hr
12/15/1990 6:00	7	0.80	0.20	<2-mo
12/17/1990 22:00	21	2.00	0.30	9-mo, 21-hr
12/21/1990 3:00	6	0.30	0.20	<2-mo
12/22/1990 1:00	14	0.40	0.20	<2-mo
12/23/1990 3:00	5	0.40	0.10	<2-mo
12/23/1990 21:00	1	0.10	0.10	<2-mo
12/27/1990 20:00	7	0.30	0.10	<2-mo
12/28/1990 22:00	9	0.20	0.10	<2-mo
12/30/1990 9:00	11	1.10	0.40	3-mo, 11-hr
3/2/1991 21:00	1	0.10	0.10	<2-mo
3/3/1991 19:00	14	0.70	0.10	<2-mo
3/5/1991 15:00	1	0.10	0.10	<2-mo
3/6/1991 8:00	9	0.60	0.10	<2-mo
3/10/1991 10:00	1	0.10	0.10	<2-mo
3/13/1991 5:00	23	0.80	0.20	<2-mo
3/17/1991 22:00	5	0.30	0.10	<2-mo
3/19/1991 12:00	1	0.10	0.10	<2-mo
3/22/1991 6:00	3	0.40	0.20	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
3/22/1991 21:00	4	0.70	0.30	<2-mo
3/23/1991 14:00	1	0.10	0.10	<2-mo
3/26/1991 12:00	3	0.60	0.40	<2-mo
3/27/1991 10:00	11	0.20	0.10	<2-mo
3/28/1991 16:00	1	0.10	0.10	<2-mo
4/1/1991 11:00	2	0.20	0.10	<2-mo
4/5/1991 3:00	2	0.20	0.10	<2-mo
4/8/1991 13:00	15	0.80	0.30	<2-mo
4/9/1991 17:00	3	0.30	0.10	<2-mo
4/13/1991 4:00	29	1.80	0.40	6-mo, 29-hr
4/15/1991 5:00	7	0.80	0.20	<2-mo
4/21/1991 12:00	1	0.10	0.10	<2-mo
4/24/1991 13:00	1	0.10	0.10	<2-mo
5/5/1991 9:00	9	0.30	0.10	<2-mo
5/7/1991 13:00	1	0.10	0.10	<2-mo
5/27/1991 10:00	7	0.30	0.10	<2-mo
6/1/1991 2:00	2	0.30	0.20	<2-mo
6/2/1991 18:00	2	1.00	0.70	5.5-mo, 2-hr
6/11/1991 21:00	2	0.40	0.30	<2-mo
6/16/1991 19:00	1	0.10	0.10	<2-mo
6/22/1991 22:00	1	0.10	0.10	<2-mo
7/1/1991 19:00	5	2.20	0.90	4-yr, 5-hr
7/8/1991 8:00	1	0.10	0.10	<2-mo
7/10/1991 9:00	1	0.10	0.10	<2-mo
7/12/1991 12:00	1	0.10	0.10	<2-mo
7/23/1991 15:00	4	1.50	1.40	1-yr, 4-hr
9/3/1991 21:00	4	0.20	0.10	<2-mo
9/4/1991 16:00	1	0.10	0.10	<2-mo
9/10/1991 10:00	1	0.10	0.10	<2-mo
9/12/1991 23:00	11	0.20	0.10	<2-mo
9/14/1991 0:00	7	0.20	0.10	<2-mo
9/17/1991 6:00	1	0.10	0.10	<2-mo
9/23/1991 0:00	3	0.30	0.10	<2-mo
9/24/1991 17:00	14	0.30	0.10	<2-mo
10/5/1991 10:00	6	0.20	0.10	<2-mo
10/10/1991 9:00	8	0.20	0.10	<2-mo
10/11/1991 12:00	1	0.10	0.10	<2-mo
10/12/1991 5:00	1	0.10	0.10	<2-mo
10/13/1991 14:00	1	0.10	0.10	<2-mo
10/14/1991 21:00	2	0.20	0.10	<2-mo
10/27/1991 12:00	1	0.10	0.10	<2-mo
11/11/1991 8:00	1	0.10	0.10	<2-mo
11/12/1991 19:00	1	0.10	0.10	<2-mo
11/13/1991 14:00	1	0.10	0.10	<2-mo
11/22/1991 10:00	3	0.20	0.10	<2-mo
11/28/1991 5:00	3	0.20	0.10	<2-mo
11/30/1991 11:00	1	0.10	0.10	<2-mo
12/2/1991 6:00	21	1.90	0.30	9-mo, 21-hr
12/13/1991 5:00	18	0.70	0.10	<2-mo
12/23/1991 5:00	4	0.50	0.20	<2-mo
12/29/1991 12:00	9	0.20	0.10	<2-mo
1/14/1992 1:00	2	0.20	0.10	<2-mo
1/23/1992 10:00	5	0.50	0.10	<2-mo
1/25/1992 19:00	1	0.10	0.10	<2-mo
1/26/1992 12:00	1	0.10	0.10	<2-mo
2/13/1992 7:00	8	0.30	0.10	<2-mo
2/15/1992 6:00	13	0.40	0.20	<2-mo
3/6/1992 8:00	5	0.50	0.20	<2-mo
3/7/1992 4:00	12	0.20	0.10	<2-mo
3/10/1992 7:00	6	0.30	0.10	<2-mo
3/18/1992 16:00	8	1.00	0.30	2-mo, 8-hr
3/25/1992 23:00	6	0.20	0.10	<2-mo
3/30/1992 10:00	12	0.50	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
5/8/1992 23:00	4	0.90	0.30	3-mo, 4-hr
5/18/1992 12:00	4	0.90	0.60	3-mo, 4-hr
5/23/1992 22:00	11	0.90	0.30	<2-mo
5/29/1992 19:00	18	0.80	0.10	<2-mo
6/4/1992 11:00	7	0.30	0.10	<2-mo
6/5/1992 17:00	1	0.10	0.10	<2-mo
6/18/1992 7:00	4	1.40	0.80	9-mo, 4-hr
6/18/1992 23:00	1	0.30	0.30	<2-mo
8/7/1992 23:00	2	0.30	0.20	<2-mo
8/8/1992 13:00	13	1.70	1.20	8.5-mo, 13-hr
8/14/1992 19:00	2	0.20	0.10	<2-mo
8/15/1992 11:00	1	0.10	0.10	<2-mo
8/27/1992 6:00	1	0.60	0.60	3-mo, 1-hr
8/27/1992 20:00	15	0.90	0.30	<2-mo
9/3/1992 6:00	7	0.50	0.20	<2-mo
9/7/1992 21:00	2	0.30	0.20	<2-mo
9/8/1992 11:00	1	0.10	0.10	<2-mo
9/18/1992 22:00	1	0.30	0.30	<2-mo
9/22/1992 3:00	6	0.50	0.30	<2-mo
10/11/1992 11:00	1	0.10	0.10	<2-mo
10/15/1992 19:00	1	0.10	0.10	<2-mo
10/16/1992 9:00	1	0.10	0.10	<2-mo
11/2/1992 5:00	13	0.50	0.20	<2-mo
11/5/1992 12:00	5	0.20	0.10	<2-mo
11/10/1992 16:00	1	0.10	0.10	<2-mo
11/11/1992 9:00	35	1.10	0.10	<2-mo
3/13/1993 8:00	12	0.70	0.10	<2-mo
3/16/1993 22:00	12	0.30	0.10	<2-mo
3/23/1993 5:00	21	1.10	0.20	<2-mo
3/31/1993 18:00	5	0.20	0.10	<2-mo
6/22/1993 13:00	1	0.10	0.10	<2-mo
6/28/1993 16:00	12	0.20	0.10	<2-mo
6/29/1993 19:00	1	0.10	0.10	<2-mo
6/30/1993 14:00	1	0.10	0.10	<2-mo
7/1/1993 14:00	11	0.90	0.80	<2-mo
7/3/1993 1:00	5	0.20	0.10	<2-mo
7/4/1993 12:00	1	0.10	0.10	<2-mo
7/10/1993 17:00	1	0.10	0.10	<2-mo
7/11/1993 12:00	21	0.90	0.30	<2-mo
7/16/1993 9:00	1	0.10	0.10	<2-mo
7/19/1993 6:00	8	1.90	1.10	1-yr, 8-hr
7/20/1993 14:00	1	0.10	0.10	<2-mo
7/24/1993 18:00	1	0.10	0.10	<2-mo
7/29/1993 11:00	1	0.10	0.10	<2-mo
8/9/1993 17:00	1	0.10	0.10	<2-mo
8/17/1993 15:00	2	0.20	0.10	<2-mo
8/18/1993 14:00	1	0.10	0.10	<2-mo
8/24/1993 23:00	1	0.10	0.10	<2-mo
9/2/1993 19:00	26	1.00	0.20	<2-mo
9/15/1993 8:00	8	0.70	0.20	<2-mo
9/24/1993 12:00	1	0.10	0.10	<2-mo
9/25/1993 13:00	15	1.10	0.40	2-mo, 15-hr
9/27/1993 11:00	1	0.10	0.10	<2-mo
10/3/1993 16:00	1	0.10	0.10	<2-mo
10/4/1993 10:00	1	0.10	0.10	<2-mo
10/19/1993 19:00	19	1.30	0.20	3-mo, 19-hr
10/21/1993 1:00	10	0.20	0.10	<2-mo
10/22/1993 14:00	1	0.10	0.10	<2-mo
10/30/1993 16:00	29	0.60	0.10	<2-mo
11/1/1993 8:00	1	0.10	0.10	<2-mo
11/3/1993 9:00	1	0.10	0.10	<2-mo
11/4/1993 16:00	1	0.10	0.10	<2-mo
11/12/1993 18:00	23	1.10	0.30	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
11/14/1993 5:00	19	1.20	0.30	2-mo, 19-hr
11/17/1993 4:00	18	1.50	0.30	5-mo, 18-hr
12/4/1993 1:00	24	0.60	0.10	<2-mo
12/21/1993 1:00	5	0.20	0.10	<2-mo
12/29/1993 12:00	1	0.10	0.10	<2-mo
1/3/1994 21:00	14	0.60	0.10	<2-mo
1/5/1994 13:00	1	0.10	0.10	<2-mo
1/6/1994 15:00	19	0.30	0.10	<2-mo
1/12/1994 2:00	4	0.20	0.10	<2-mo
1/13/1994 14:00	1	0.10	0.10	<2-mo
1/17/1994 2:00	11	0.40	0.10	<2-mo
1/19/1994 20:00	1	0.10	0.10	<2-mo
1/20/1994 12:00	1	0.10	0.10	<2-mo
1/25/1994 13:00	14	0.50	0.20	<2-mo
1/27/1994 11:00	23	1.10	0.10	<2-mo
2/4/1994 20:00	1	0.10	0.10	<2-mo
2/8/1994 7:00	19	0.90	0.20	<2-mo
2/13/1994 3:00	1	0.10	0.10	<2-mo
2/21/1994 3:00	1	0.10	0.10	<2-mo
2/22/1994 23:00	11	0.60	0.20	<2-mo
2/25/1994 20:00	1	0.10	0.10	<2-mo
3/2/1994 10:00	18	0.30	0.10	<2-mo
3/9/1994 8:00	18	1.20	0.20	2-mo, 18-hr
3/10/1994 13:00	1	0.10	0.10	<2-mo
3/13/1994 21:00	1	0.10	0.10	<2-mo
3/21/1994 7:00	12	0.60	0.20	<2-mo
3/27/1994 21:00	7	0.30	0.10	<2-mo
3/29/1994 4:00	1	0.10	0.10	<2-mo
4/3/1994 16:00	1	0.10	0.10	<2-mo
4/6/1994 17:00	5	0.40	0.10	<2-mo
4/10/1994 3:00	17	1.70	0.50	6-mo, 17-hr
4/11/1994 19:00	18	0.30	0.10	<2-mo
4/13/1994 5:00	10	0.30	0.10	<2-mo
4/15/1994 18:00	1	0.10	0.10	<2-mo
4/28/1994 22:00	1	0.10	0.10	<2-mo
4/29/1994 10:00	4	0.20	0.10	<2-mo
4/30/1994 15:00	9	0.20	0.10	<2-mo
5/3/1994 18:00	1	0.10	0.10	<2-mo
5/5/1994 9:00	1	0.10	0.10	<2-mo
5/6/1994 10:00	1	0.10	0.10	<2-mo
5/7/1994 5:00	21	0.80	0.30	<2-mo
5/12/1994 3:00	5	0.20	0.10	<2-mo
5/15/1994 2:00	18	0.80	0.40	<2-mo
5/25/1994 9:00	15	0.50	0.10	<2-mo
6/6/1994 17:00	22	0.60	0.30	<2-mo
6/11/1994 11:00	1	0.10	0.10	<2-mo
6/18/1994 17:00	2	0.50	0.40	<2-mo
6/20/1994 19:00	6	0.70	0.30	<2-mo
6/23/1994 20:00	6	0.90	0.30	2-mo, 6-hr
6/24/1994 15:00	6	0.60	0.40	<2-mo
6/26/1994 11:00	9	0.90	0.20	<2-mo
6/29/1994 14:00	13	1.20	0.60	3-mo, 13-hr
7/8/1994 1:00	3	0.30	0.10	<2-mo
7/13/1994 16:00	15	0.70	0.30	<2-mo
7/14/1994 19:00	3	0.20	0.10	<2-mo
7/15/1994 14:00	2	0.90	0.50	4-mo, 2-hr
7/21/1994 19:00	1	0.10	0.10	<2-mo
7/22/1994 13:00	1	0.20	0.20	<2-mo
7/25/1994 2:00	17	2.60	2.00	2.5-yr, 17-hr
7/29/1994 18:00	3	0.30	0.10	<2-mo
8/4/1994 17:00	14	0.40	0.10	<2-mo
8/20/1994 21:00	9	0.40	0.10	<2-mo
8/28/1994 20:00	8	0.80	0.30	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
8/31/1994 6:00	10	0.50	0.20	<2-mo
9/10/1994 9:00	1	0.30	0.30	<2-mo
9/17/1994 13:00	4	1.00	0.50	4-mo, 4-hr
9/25/1994 7:00	14	0.60	0.30	<2-mo
9/27/1994 4:00	1	0.10	0.10	<2-mo
10/9/1994 6:00	1	0.10	0.10	<2-mo
10/13/1994 13:00	1	0.10	0.10	<2-mo
10/19/1994 7:00	1	0.10	0.10	<2-mo
10/24/1994 20:00	1	0.10	0.10	<2-mo
10/31/1994 7:00	22	0.40	0.10	<2-mo
11/1/1994 19:00	1	0.10	0.10	<2-mo
11/6/1994 2:00	1	0.10	0.10	<2-mo
11/8/1994 18:00	1	0.10	0.10	<2-mo
11/9/1994 13:00	15	0.80	0.30	<2-mo
11/16/1994 1:00	17	0.60	0.10	<2-mo
11/27/1994 17:00	13	0.60	0.20	<2-mo
12/4/1994 23:00	8	0.60	0.20	<2-mo
12/7/1994 15:00	1	0.10	0.10	<2-mo
12/9/1994 10:00	7	0.50	0.20	<2-mo
12/10/1994 11:00	9	0.50	0.10	<2-mo
12/16/1994 16:00	5	0.40	0.20	<2-mo
1/6/1995 18:00	8	0.40	0.10	<2-mo
1/11/1995 7:00	19	0.50	0.10	<2-mo
1/14/1995 21:00	10	1.70	0.50	9-mo, 10-hr
1/15/1995 19:00	9	1.30	0.30	4-mo, 9-hr
1/20/1995 16:00	7	0.20	0.10	<2-mo
1/22/1995 4:00	1	0.10	0.10	<2-mo
2/3/1995 23:00	1	0.10	0.10	<2-mo
2/4/1995 16:00	1	0.10	0.10	<2-mo
2/10/1995 11:00	1	0.10	0.10	<2-mo
2/12/1995 14:00	1	0.10	0.10	<2-mo
2/15/1995 6:00	16	0.80	0.10	<2-mo
2/24/1995 0:00	3	0.20	0.10	<2-mo
2/27/1995 13:00	15	0.60	0.10	<2-mo
3/6/1995 5:00	5	0.20	0.10	<2-mo
3/8/1995 2:00	11	0.80	0.10	<2-mo
4/8/1995 20:00	6	0.30	0.10	<2-mo
4/10/1995 8:00	5	0.30	0.20	<2-mo
4/12/1995 7:00	8	0.30	0.10	<2-mo
4/21/1995 5:00	5	0.40	0.10	<2-mo
4/23/1995 23:00	1	0.10	0.10	<2-mo
5/2/1995 3:00	10	0.60	0.20	<2-mo
5/9/1995 9:00	8	0.80	0.30	<2-mo
5/10/1995 20:00	2	0.20	0.10	<2-mo
5/14/1995 2:00	8	2.50	1.20	4-yr, 8-hr
5/17/1995 1:00	16	1.00	0.20	<2-mo
5/18/1995 4:00	5	1.20	0.40	5.5-mo, 5-hr
5/18/1995 20:00	2	0.30	0.20	<2-mo
5/24/1995 19:00	19	1.20	0.20	2-mo, 19-hr
5/28/1995 7:00	4	0.50	0.20	<2-mo
6/1/1995 7:00	13	0.60	0.20	<2-mo
6/3/1995 1:00	16	0.40	0.10	<2-mo
6/10/1995 1:00	17	0.80	0.40	<2-mo
6/12/1995 1:00	3	0.20	0.10	<2-mo
6/21/1995 1:00	1	0.40	0.40	<2-mo
6/26/1995 12:00	3	0.20	0.10	<2-mo
6/27/1995 3:00	1	0.40	0.40	<2-mo
6/29/1995 15:00	12	0.60	0.10	<2-mo
6/30/1995 14:00	7	0.70	0.30	<2-mo
7/1/1995 11:00	1	0.10	0.10	<2-mo
7/6/1995 5:00	1	0.10	0.10	<2-mo
7/13/1995 23:00	1	0.10	0.10	<2-mo
7/21/1995 3:00	10	1.10	0.30	3-mo, 10-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
7/23/1995 19:00	2	0.90	0.80	4-mo, 2-hr
7/24/1995 14:00	1	0.10	0.10	<2-mo
7/25/1995 19:00	1	0.10	0.10	<2-mo
7/26/1995 17:00	3	1.00	0.40	4-mo, 3-hr
7/27/1995 17:00	1	0.10	0.10	<2-mo
8/4/1995 12:00	52	2.40	0.30	1-yr, 52-hr
8/8/1995 1:00	1	0.10	0.10	<2-mo
8/9/1995 8:00	11	0.60	0.40	<2-mo
8/17/1995 21:00	1	0.10	0.10	<2-mo
9/9/1995 5:00	1	0.10	0.10	<2-mo
9/12/1995 12:00	13	0.40	0.10	<2-mo
9/17/1995 16:00	1	0.10	0.10	<2-mo
9/18/1995 17:00	1	0.10	0.10	<2-mo
9/20/1995 9:00	1	0.10	0.10	<2-mo
9/22/1995 12:00	1	0.10	0.10	<2-mo
10/3/1995 13:00	8	0.40	0.20	<2-mo
10/5/1995 5:00	13	1.70	0.30	8.5-mo, 13-hr
10/14/1995 2:00	13	0.40	0.10	<2-mo
10/20/1995 14:00	3	0.20	0.10	<2-mo
10/22/1995 19:00	1	0.10	0.10	<2-mo
10/27/1995 9:00	1	0.10	0.10	<2-mo
10/28/1995 12:00	1	0.10	0.10	<2-mo
11/1/1995 23:00	11	0.20	0.10	<2-mo
11/7/1995 3:00	5	0.40	0.10	<2-mo
11/11/1995 7:00	7	0.60	0.20	<2-mo
11/12/1995 2:00	1	0.10	0.10	<2-mo
11/13/1995 11:00	1	0.10	0.10	<2-mo
11/14/1995 0:00	1	0.10	0.10	<2-mo
11/17/1995 22:00	2	0.20	0.10	<2-mo
11/25/1995 3:00	1	0.10	0.10	<2-mo
12/3/1995 8:00	1	0.10	0.10	<2-mo
12/6/1995 11:00	1	0.10	0.10	<2-mo
12/10/1995 11:00	1	0.10	0.10	<2-mo
12/13/1995 8:00	22	0.60	0.10	<2-mo
12/15/1995 21:00	3	0.30	0.20	<2-mo
12/18/1995 8:00	36	1.60	0.20	4-mo, 36-hr
12/31/1995 18:00	7	0.20	0.10	<2-mo
1/2/1996 9:00	18	0.70	0.20	<2-mo
1/4/1996 23:00	1	0.10	0.10	<2-mo
1/7/1996 2:00	23	1.00	0.10	<2-mo
1/9/1996 10:00	1	0.10	0.10	<2-mo
1/12/1996 1:00	9	0.40	0.10	<2-mo
1/18/1996 22:00	6	0.60	0.20	<2-mo
1/23/1996 7:00	27	1.10	0.20	<2-mo
1/27/1996 2:00	5	0.20	0.10	<2-mo
2/8/1996 14:00	4	0.20	0.10	<2-mo
2/19/1996 23:00	10	0.40	0.10	<2-mo
2/26/1996 13:00	4	0.20	0.10	<2-mo
2/27/1996 5:00	20	0.70	0.20	<2-mo
3/5/1996 22:00	19	0.70	0.10	<2-mo
3/7/1996 10:00	6	0.20	0.10	<2-mo
3/15/1996 3:00	8	0.30	0.10	<2-mo
3/19/1996 10:00	38	1.60	0.20	4-mo, 38-hr
4/1/1996 5:00	12	0.50	0.10	<2-mo
4/15/1996 16:00	26	0.70	0.10	<2-mo
4/23/1996 8:00	7	0.40	0.10	<2-mo
4/29/1996 3:00	30	2.00	0.30	9-mo, 30-hr
5/1/1996 18:00	1	0.20	0.20	<2-mo
5/4/1996 7:00	13	0.90	0.30	<2-mo
5/5/1996 19:00	1	0.20	0.20	<2-mo
5/7/1996 18:00	16	0.30	0.10	<2-mo
5/8/1996 22:00	13	0.70	0.30	<2-mo
5/10/1996 20:00	18	1.00	0.30	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
5/15/1996 11:00	25	1.30	0.40	2-mo, 25-hr
5/21/1996 12:00	1	0.10	0.10	<2-mo
5/23/1996 20:00	1	0.10	0.10	<2-mo
5/26/1996 9:00	1	0.10	0.10	<2-mo
5/27/1996 0:00	1	0.10	0.10	<2-mo
5/27/1996 13:00	10	0.90	0.40	<2-mo
5/28/1996 22:00	9	1.40	0.80	6-mo, 9-hr
6/2/1996 11:00	14	0.40	0.10	<2-mo
6/3/1996 20:00	3	0.30	0.20	<2-mo
6/4/1996 22:00	1	0.10	0.10	<2-mo
6/6/1996 15:00	29	0.90	0.30	<2-mo
6/8/1996 19:00	11	0.40	0.10	<2-mo
6/11/1996 12:00	2	0.20	0.10	<2-mo
6/12/1996 1:00	17	0.30	0.10	<2-mo
6/14/1996 6:00	11	1.50	0.70	6-mo, 11-hr
6/18/1996 19:00	1	0.10	0.10	<2-mo
6/20/1996 10:00	1	0.10	0.10	<2-mo
6/30/1996 17:00	2	0.20	0.10	<2-mo
7/1/1996 9:00	1	0.10	0.10	<2-mo
7/13/1996 8:00	1	0.10	0.10	<2-mo
7/14/1996 2:00	1	0.10	0.10	<2-mo
7/15/1996 3:00	6	0.70	0.20	<2-mo
7/18/1996 2:00	15	2.10	1.20	1-yr, 15-hr
7/22/1996 0:00	5	0.70	0.40	<2-mo
7/24/1996 17:00	9	0.50	0.30	<2-mo
7/29/1996 17:00	2	0.30	0.20	<2-mo
7/30/1996 13:00	4	0.90	0.50	3-mo, 4-hr
8/2/1996 15:00	1	0.70	0.70	4-mo, 1-hr
9/6/1996 14:00	11	0.80	0.10	<2-mo
9/7/1996 14:00	1	0.10	0.10	<2-mo
9/21/1996 17:00	7	0.30	0.10	<2-mo
9/26/1996 11:00	2	0.20	0.10	<2-mo
9/27/1996 20:00	17	1.70	0.40	6-mo, 17-hr
10/9/1996 6:00	14	0.50	0.20	<2-mo
10/18/1996 10:00	5	0.60	0.20	<2-mo
10/19/1996 15:00	1	0.10	0.10	<2-mo
10/23/1996 6:00	1	0.10	0.10	<2-mo
10/26/1996 15:00	5	0.20	0.10	<2-mo
10/28/1996 8:00	1	0.10	0.10	<2-mo
11/6/1996 15:00	2	0.20	0.10	<2-mo
11/7/1996 8:00	19	0.90	0.20	<2-mo
11/9/1996 0:00	1	0.10	0.10	<2-mo
11/9/1996 23:00	1	0.10	0.10	<2-mo
11/16/1996 12:00	1	0.10	0.10	<2-mo
11/17/1996 19:00	12	0.30	0.10	<2-mo
11/21/1996 5:00	4	0.20	0.10	<2-mo
11/22/1996 11:00	1	0.10	0.10	<2-mo
11/25/1996 11:00	18	0.90	0.20	<2-mo
11/30/1996 4:00	8	0.40	0.10	<2-mo
11/30/1996 23:00	7	0.70	0.20	<2-mo
12/5/1996 18:00	1	0.10	0.10	<2-mo
12/12/1996 8:00	5	0.30	0.10	<2-mo
12/16/1996 20:00	13	1.00	0.20	<2-mo
12/22/1996 18:00	1	0.10	0.10	<2-mo
12/23/1996 16:00	12	0.20	0.10	<2-mo
1/5/1997 4:00	5	0.20	0.10	<2-mo
1/9/1997 14:00	1	0.10	0.10	<2-mo
1/15/1997 22:00	1	0.10	0.10	<2-mo
1/24/1997 11:00	15	0.60	0.10	<2-mo
1/27/1997 10:00	13	0.70	0.10	<2-mo
2/4/1997 8:00	13	0.70	0.20	<2-mo
2/8/1997 3:00	1	0.10	0.10	<2-mo
2/13/1997 22:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
2/26/1997 16:00	1	0.10	0.10	<2-mo
3/1/1997 3:00	25	1.90	0.20	7.5-mo, 25-hr
3/3/1997 9:00	8	0.30	0.10	<2-mo
3/5/1997 15:00	6	0.30	0.10	<2-mo
3/9/1997 16:00	7	0.50	0.10	<2-mo
3/14/1997 1:00	10	0.40	0.10	<2-mo
3/18/1997 9:00	9	0.60	0.10	<2-mo
3/25/1997 20:00	3	0.20	0.10	<2-mo
3/30/1997 16:00	1	0.10	0.10	<2-mo
5/2/1997 23:00	8	0.50	0.10	<2-mo
5/3/1997 20:00	1	0.10	0.10	<2-mo
5/8/1997 14:00	4	0.20	0.10	<2-mo
5/25/1997 8:00	11	0.80	0.20	<2-mo
5/31/1997 13:00	20	0.80	0.20	<2-mo
6/2/1997 18:00	3	0.70	0.60	<2-mo
6/3/1997 15:00	1	0.10	0.10	<2-mo
6/13/1997 11:00	1	0.20	0.20	<2-mo
6/16/1997 21:00	2	0.50	0.40	<2-mo
6/18/1997 3:00	12	0.70	0.30	<2-mo
7/1/1997 8:00	8	0.50	0.40	<2-mo
7/2/1997 19:00	1	0.50	0.50	<2-mo
7/3/1997 9:00	1	0.10	0.10	<2-mo
7/9/1997 9:00	3	0.30	0.10	<2-mo
7/22/1997 2:00	1	0.10	0.10	<2-mo
7/23/1997 8:00	9	0.60	0.40	<2-mo
7/26/1997 20:00	6	2.90	1.50	10-yr, 6-hr
7/27/1997 20:00	1	0.10	0.10	<2-mo
7/28/1997 14:00	2	0.20	0.10	<2-mo
8/4/1997 5:00	4	1.00	0.50	4-mo, 4-hr
8/10/1997 23:00	1	0.60	0.60	3-mo, 1-hr
8/13/1997 5:00	13	0.70	0.30	<2-mo
8/14/1997 17:00	1	0.10	0.10	<2-mo
8/15/1997 8:00	5	0.90	0.40	2-mo, 5-hr
8/16/1997 23:00	7	0.90	0.40	<2-mo
8/17/1997 22:00	3	1.00	0.40	4-mo, 3-hr
8/18/1997 12:00	1	0.10	0.10	<2-mo
8/20/1997 2:00	9	1.00	0.30	2-mo, 9-hr
8/21/1997 20:00	1	0.10	0.10	<2-mo
8/22/1997 21:00	1	0.20	0.20	<2-mo
8/23/1997 11:00	1	0.10	0.10	<2-mo
8/28/1997 16:00	1	0.10	0.10	<2-mo
9/9/1997 21:00	3	0.80	0.50	2-mo, 3-hr
9/10/1997 21:00	1	0.10	0.10	<2-mo
9/19/1997 12:00	1	0.10	0.10	<2-mo
9/20/1997 3:00	6	1.10	0.80	4-mo, 6-hr
10/3/1997 11:00	1	0.10	0.10	<2-mo
10/5/1997 5:00	1	0.10	0.10	<2-mo
10/9/1997 5:00	1	0.10	0.10	<2-mo
10/14/1997 2:00	1	0.10	0.10	<2-mo
10/15/1997 12:00	1	0.10	0.10	<2-mo
10/24/1997 22:00	5	0.20	0.10	<2-mo
10/26/1997 14:00	11	1.40	0.40	5-mo, 11-hr
11/7/1997 21:00	26	0.70	0.10	<2-mo
11/13/1997 20:00	10	1.00	0.30	2-mo, 10-hr
11/15/1997 15:00	1	0.10	0.10	<2-mo
11/21/1997 18:00	15	1.10	0.20	2-mo, 15-hr
11/30/1997 7:00	10	0.40	0.10	<2-mo
12/3/1997 23:00	2	0.40	0.20	<2-mo
12/6/1997 20:00	1	0.10	0.10	<2-mo
12/10/1997 3:00	12	0.80	0.20	<2-mo
12/22/1997 7:00	10	0.40	0.10	<2-mo
12/24/1997 16:00	7	0.30	0.10	<2-mo
1/5/1998 22:00	7	0.50	0.20	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
1/7/1998 13:00	13	1.50	0.20	5-mo, 13-hr
1/8/1998 17:00	10	0.60	0.20	<2-mo
1/22/1998 22:00	9	0.30	0.10	<2-mo
1/24/1998 15:00	1	0.10	0.10	<2-mo
2/4/1998 15:00	31	1.10	0.10	<2-mo
2/11/1998 14:00	10	0.40	0.10	<2-mo
2/12/1998 11:00	1	0.10	0.10	<2-mo
2/16/1998 14:00	5	0.40	0.10	<2-mo
2/17/1998 12:00	30	0.80	0.10	<2-mo
2/20/1998 13:00	1	0.10	0.10	<2-mo
3/1/1998 0:00	1	0.10	0.10	<2-mo
3/8/1998 10:00	6	0.30	0.10	<2-mo
3/9/1998 5:00	2	0.30	0.20	<2-mo
3/9/1998 19:00	1	0.10	0.10	<2-mo
3/18/1998 2:00	18	0.40	0.10	<2-mo
3/20/1998 14:00	27	0.90	0.10	<2-mo
5/7/1998 15:00	9	0.50	0.20	<2-mo
5/8/1998 17:00	7	0.20	0.10	<2-mo
5/15/1998 15:00	1	0.10	0.10	<2-mo
5/23/1998 2:00	9	0.30	0.10	<2-mo
5/24/1998 1:00	12	0.30	0.10	<2-mo
5/26/1998 17:00	1	0.10	0.10	<2-mo
5/27/1998 10:00	1	0.10	0.10	<2-mo
5/30/1998 3:00	1	0.10	0.10	<2-mo
5/31/1998 21:00	1	0.10	0.10	<2-mo
6/1/1998 15:00	1	0.10	0.10	<2-mo
6/9/1998 8:00	16	0.30	0.10	<2-mo
6/11/1998 12:00	8	0.90	0.40	<2-mo
6/12/1998 13:00	13	2.20	0.80	1.5-yr, 13-hr
6/13/1998 14:00	1	0.10	0.10	<2-mo
6/15/1998 1:00	23	0.60	0.10	<2-mo
6/16/1998 14:00	7	0.60	0.40	<2-mo
6/23/1998 12:00	1	0.10	0.10	<2-mo
6/26/1998 23:00	6	0.60	0.50	<2-mo
6/28/1998 11:00	3	0.20	0.10	<2-mo
6/29/1998 4:00	2	0.30	0.20	<2-mo
6/30/1998 1:00	2	0.30	0.20	<2-mo
6/30/1998 20:00	1	0.10	0.10	<2-mo
7/4/1998 7:00	3	0.40	0.20	<2-mo
7/5/1998 16:00	1	0.10	0.10	<2-mo
7/15/1998 9:00	1	0.10	0.10	<2-mo
7/19/1998 22:00	5	0.60	0.20	<2-mo
7/23/1998 11:00	1	0.10	0.10	<2-mo
7/29/1998 15:00	2	0.20	0.10	<2-mo
7/30/1998 13:00	2	0.20	0.10	<2-mo
8/2/1998 10:00	1	0.10	0.10	<2-mo
8/10/1998 10:00	2	0.40	0.30	<2-mo
8/20/1998 15:00	8	0.50	0.30	<2-mo
8/21/1998 10:00	1	0.10	0.10	<2-mo
8/23/1998 11:00	1	0.10	0.10	<2-mo
8/24/1998 21:00	9	0.20	0.10	<2-mo
8/25/1998 18:00	3	0.70	0.50	<2-mo
8/29/1998 3:00	4	0.20	0.10	<2-mo
9/7/1998 7:00	13	1.40	0.70	4-mo, 13-hr
9/8/1998 18:00	1	0.10	0.10	<2-mo
9/21/1998 3:00	4	0.40	0.10	<2-mo
9/22/1998 1:00	8	0.60	0.30	<2-mo
9/25/1998 14:00	1	0.10	0.10	<2-mo
9/27/1998 22:00	5	0.20	0.10	<2-mo
9/28/1998 14:00	1	0.10	0.10	<2-mo
10/3/1998 12:00	10	0.60	0.20	<2-mo
10/6/1998 13:00	12	3.50	1.50	15-yr, 12-hr
10/17/1998 17:00	8	0.70	0.30	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event Date/Time	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
10/22/1998 14:00	1	0.10	0.10	<2-mo
10/29/1998 5:00	5	0.50	0.20	<2-mo
11/2/1998 19:00	1	0.10	0.10	<2-mo
11/8/1998 16:00	27	0.80	0.30	<2-mo
11/15/1998 10:00	1	0.10	0.10	<2-mo
11/19/1998 6:00	3	0.40	0.20	<2-mo
11/24/1998 20:00	6	0.50	0.20	<2-mo
12/6/1998 6:00	1	0.10	0.10	<2-mo
12/7/1998 8:00	1	0.10	0.10	<2-mo
12/16/1998 22:00	1	0.10	0.10	<2-mo
12/19/1998 21:00	1	0.10	0.10	<2-mo
12/21/1998 9:00	16	1.60	0.20	6-mo, 16-hr
1/1/1999 4:00	20	0.80	0.10	<2-mo
1/6/1999 23:00	1	0.10	0.10	<2-mo
1/8/1999 4:00	25	1.20	0.20	2-mo, 25-hr
1/11/1999 23:00	1	0.10	0.10	<2-mo
1/13/1999 8:00	21	0.60	0.10	<2-mo
1/14/1999 16:00	10	0.30	0.10	<2-mo
1/16/1999 11:00	1	0.10	0.10	<2-mo
1/17/1999 20:00	7	0.30	0.10	<2-mo
1/21/1999 9:00	17	1.30	0.40	3-mo, 17-hr
2/1/1999 11:00	7	0.30	0.10	<2-mo
2/2/1999 7:00	1	0.10	0.10	<2-mo
2/6/1999 17:00	1	0.40	0.40	<2-mo
2/7/1999 8:00	11	0.90	0.30	<2-mo
2/12/1999 5:00	7	0.20	0.10	<2-mo
2/13/1999 1:00	1	0.10	0.10	<2-mo
2/16/1999 13:00	1	0.10	0.10	<2-mo
2/17/1999 18:00	1	0.10	0.10	<2-mo
2/24/1999 11:00	1	0.10	0.10	<2-mo
2/25/1999 5:00	1	0.10	0.10	<2-mo
2/26/1999 1:00	1	0.10	0.10	<2-mo
2/27/1999 9:00	18	0.60	0.10	<2-mo
2/28/1999 19:00	8	0.20	0.10	<2-mo
3/3/1999 5:00	21	0.60	0.10	<2-mo
3/6/1999 4:00	6	0.70	0.20	<2-mo
3/9/1999 6:00	12	0.80	0.10	<2-mo
4/1/1999 3:00	6	0.20	0.10	<2-mo
4/3/1999 16:00	1	0.10	0.10	<2-mo
4/4/1999 11:00	1	0.10	0.10	<2-mo
4/11/1999 2:00	16	0.50	0.10	<2-mo
4/17/1999 6:00	14	0.60	0.20	<2-mo
4/18/1999 23:00	10	0.40	0.10	<2-mo
4/20/1999 8:00	4	0.20	0.10	<2-mo
4/21/1999 12:00	1	0.10	0.10	<2-mo
4/22/1999 20:00	5	0.80	0.30	<2-mo
4/24/1999 11:00	7	0.20	0.10	<2-mo
4/29/1999 1:00	1	0.10	0.10	<2-mo
5/16/1999 2:00	1	0.10	0.10	<2-mo
5/16/1999 18:00	1	0.10	0.10	<2-mo
5/24/1999 7:00	9	1.30	0.60	4-mo, 9-hr
5/25/1999 7:00	11	0.60	0.30	<2-mo
6/1/1999 13:00	1	0.10	0.10	<2-mo
6/2/1999 21:00	1	0.10	0.10	<2-mo
7/13/1999 14:00	2	0.30	0.20	<2-mo
7/15/1999 15:00	1	0.10	0.10	<2-mo
7/18/1999 17:00	6	0.90	0.70	2-mo, 6-hr
7/20/1999 11:00	1	0.40	0.40	<2-mo
7/21/1999 5:00	1	0.10	0.10	<2-mo
7/22/1999 2:00	1	0.10	0.10	<2-mo
7/24/1999 0:00	5	0.20	0.10	<2-mo
8/13/1999 8:00	1	0.10	0.10	<2-mo
8/19/1999 12:00	6	0.20	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
8/24/1999 12:00	34	3.20	0.80	3-yr, 34-hr
8/26/1999 21:00	1	0.10	0.10	<2-mo
8/27/1999 12:00	1	0.10	0.10	<2-mo
9/6/1999 16:00	17	0.60	0.30	<2-mo
9/20/1999 11:00	10	0.20	0.10	<2-mo
9/24/1999 18:00	9	0.30	0.10	<2-mo
9/27/1999 15:00	1	0.10	0.10	<2-mo
9/29/1999 5:00	18	1.90	0.90	9-mo, 18-hr
10/4/1999 0:00	9	0.30	0.10	<2-mo
10/9/1999 6:00	24	0.70	0.10	<2-mo
10/13/1999 17:00	1	0.50	0.50	<2-mo
10/17/1999 17:00	1	0.10	0.10	<2-mo
11/5/1999 15:00	1	0.20	0.20	<2-mo
11/7/1999 8:00	1	0.10	0.10	<2-mo
11/11/1999 5:00	1	0.10	0.10	<2-mo
11/12/1999 20:00	19	0.40	0.10	<2-mo
11/22/1999 19:00	2	0.20	0.10	<2-mo
12/9/1999 3:00	1	0.10	0.10	<2-mo
12/10/1999 6:00	3	0.60	0.40	<2-mo
12/13/1999 7:00	1	0.10	0.10	<2-mo
12/13/1999 23:00	13	1.40	0.40	4-mo, 13-hr
1/2/2000 23:00	5	0.40	0.10	<2-mo
1/3/2000 19:00	9	2.80	0.60	5-yr, 9-hr
1/10/2000 9:00	1	0.10	0.10	<2-mo
1/20/2000 3:00	4	0.20	0.10	<2-mo
1/22/2000 20:00	1	0.10	0.10	<2-mo
1/30/2000 11:00	1	0.10	0.10	<2-mo
2/11/2000 0:00	8	0.30	0.10	<2-mo
2/13/2000 15:00	24	1.60	0.20	5-mo, 24-hr
2/18/2000 1:00	21	1.80	0.40	8-mo, 21-hr
3/11/2000 18:00	20	0.60	0.20	<2-mo
3/16/2000 11:00	11	0.60	0.10	<2-mo
3/19/2000 8:00	31	1.70	0.20	5-mo, 31-hr
3/21/2000 15:00	1	0.10	0.10	<2-mo
4/2/2000 22:00	41	1.40	0.10	3-mo, 41-hr
5/10/2000 5:00	1	0.10	0.10	<2-mo
5/19/2000 6:00	2	0.20	0.10	<2-mo
5/23/2000 4:00	17	1.60	0.40	5.5-mo, 17-hr
5/27/2000 9:00	1	0.10	0.10	<2-mo
5/28/2000 3:00	27	1.00	0.20	<2-mo
6/2/2000 19:00	1	0.10	0.10	<2-mo
6/5/2000 13:00	8	0.50	0.10	<2-mo
6/16/2000 21:00	7	1.30	0.50	5-mo, 7-hr
6/18/2000 11:00	3	0.40	0.20	<2-mo
6/27/2000 0:00	9	0.50	0.20	<2-mo
7/3/2000 15:00	1	0.10	0.10	<2-mo
7/10/2000 8:00	1	0.10	0.10	<2-mo
7/14/2000 14:00	5	0.40	0.30	<2-mo
7/19/2000 8:00	4	0.70	0.40	<2-mo
7/28/2000 12:00	1	0.20	0.20	<2-mo
7/29/2000 1:00	3	0.60	0.40	<2-mo
8/9/2000 17:00	5	0.40	0.20	<2-mo
8/17/2000 17:00	2	0.50	0.40	<2-mo
8/18/2000 6:00	1	0.10	0.10	<2-mo
8/24/2000 4:00	2	0.60	0.30	<2-mo
8/24/2000 18:00	1	0.20	0.20	<2-mo
8/27/2000 6:00	3	0.50	0.30	<2-mo
9/4/2000 10:00	4	0.30	0.10	<2-mo
9/20/2000 23:00	7	0.30	0.20	<2-mo
9/23/2000 13:00	11	1.20	0.40	3-mo, 11-hr
9/25/2000 14:00	15	0.80	0.20	<2-mo
10/5/2000 2:00	11	0.50	0.10	<2-mo
10/6/2000 1:00	3	0.30	0.20	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
11/9/2000 6:00	3	0.20	0.10	<2-mo
11/9/2000 20:00	2	0.20	0.10	<2-mo
11/25/2000 12:00	9	0.40	0.10	<2-mo
11/26/2000 23:00	1	0.10	0.10	<2-mo
12/1/2000 16:00	8	0.30	0.10	<2-mo
12/11/2000 17:00	8	0.50	0.20	<2-mo
12/13/2000 21:00	7	0.50	0.20	<2-mo
12/16/2000 7:00	21	2.80	0.30	3-yr, 21-hr
1/17/2001 12:00	1	0.10	0.10	<2-mo
1/19/2001 5:00	16	0.30	0.10	<2-mo
1/20/2001 11:00	1	0.10	0.10	<2-mo
1/29/2001 23:00	27	0.90	0.10	<2-mo
2/14/2001 19:00	10	0.30	0.10	<2-mo
2/15/2001 21:00	20	0.40	0.10	<2-mo
3/4/2001 11:00	11	0.80	0.20	<2-mo
3/12/2001 23:00	4	0.20	0.10	<2-mo
3/13/2001 18:00	1	0.10	0.10	<2-mo
3/16/2001 7:00	5	0.20	0.10	<2-mo
3/16/2001 23:00	1	0.10	0.10	<2-mo
3/21/2001 7:00	11	0.40	0.10	<2-mo
4/9/2001 22:00	40	3.20	0.40	3-yr, 40-hr
4/20/2001 9:00	7	0.90	0.20	<2-mo
4/21/2001 8:00	2	0.20	0.10	<2-mo
5/8/2001 4:00	10	0.30	0.10	<2-mo
5/12/2001 7:00	2	0.20	0.10	<2-mo
5/15/2001 11:00	1	0.10	0.10	<2-mo
5/16/2001 3:00	19	1.30	0.50	3-mo, 19-hr
5/17/2001 16:00	2	0.70	0.50	2-mo, 2-hr
5/18/2001 15:00	8	0.90	0.20	<2-mo
5/22/2001 7:00	7	0.70	0.30	<2-mo
6/1/2001 7:00	9	0.30	0.10	<2-mo
6/2/2001 18:00	1	0.30	0.30	<2-mo
6/6/2001 11:00	9	0.60	0.30	<2-mo
6/21/2001 18:00	5	0.20	0.10	<2-mo
7/17/2001 13:00	14	0.40	0.10	<2-mo
7/25/2001 13:00	4	1.80	1.30	2-yr, 4-hr
7/26/2001 6:00	2	0.20	0.10	<2-mo
7/29/2001 9:00	2	1.10	0.90	8-mo, 2-hr
8/3/2001 21:00	4	0.50	0.20	<2-mo
8/10/2001 18:00	2	1.80	1.40	4-yr, 2-hr
8/16/2001 22:00	3	0.20	0.10	<2-mo
8/19/2001 0:00	4	0.80	0.40	2-mo, 4-hr
8/22/2001 14:00	1	0.10	0.10	<2-mo
8/23/2001 9:00	3	0.20	0.10	<2-mo
8/26/2001 9:00	11	0.70	0.30	<2-mo
8/28/2001 15:00	2	0.20	0.10	<2-mo
8/29/2001 13:00	1	0.10	0.10	<2-mo
8/31/2001 15:00	3	0.20	0.10	<2-mo
9/10/2001 8:00	1	0.10	0.10	<2-mo
9/14/2001 2:00	11	0.40	0.10	<2-mo
9/18/2001 14:00	1	0.10	0.10	<2-mo
9/19/2001 21:00	4	0.50	0.30	<2-mo
9/20/2001 18:00	1	0.10	0.10	<2-mo
9/24/2001 8:00	5	0.20	0.10	<2-mo
10/5/2001 18:00	14	0.60	0.10	<2-mo
10/12/2001 3:00	11	0.90	0.20	<2-mo
10/14/2001 5:00	6	0.40	0.20	<2-mo
10/16/2001 6:00	1	0.20	0.20	<2-mo
10/23/2001 17:00	30	2.10	0.60	9-mo, 30-hr
11/2/2001 16:00	11	0.30	0.10	<2-mo
11/8/2001 11:00	1	0.10	0.10	<2-mo
11/9/2001 11:00	1	0.10	0.10	<2-mo
11/16/2001 12:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
11/17/2001 3:00	1	0.10	0.10	<2-mo
11/19/2001 16:00	4	0.40	0.10	<2-mo
11/24/2001 14:00	13	0.60	0.30	<2-mo
11/27/2001 2:00	10	1.00	0.30	2-mo, 10-hr
11/28/2001 8:00	8	0.40	0.10	<2-mo
12/13/2001 0:00	7	0.20	0.10	<2-mo
12/14/2001 5:00	8	0.20	0.10	<2-mo
12/16/2001 23:00	27	1.40	0.20	3-mo, 27-hr
12/23/2001 4:00	2	0.20	0.10	<2-mo
1/6/2002 11:00	20	0.50	0.10	<2-mo
1/19/2002 9:00	1	0.10	0.10	<2-mo
1/21/2002 5:00	6	0.20	0.10	<2-mo
1/24/2002 4:00	7	0.80	0.20	<2-mo
1/30/2002 4:00	15	0.60	0.10	<2-mo
2/1/2002 7:00	2	0.20	0.10	<2-mo
2/10/2002 15:00	9	0.20	0.10	<2-mo
2/20/2002 9:00	13	0.70	0.30	<2-mo
2/26/2002 6:00	1	0.10	0.10	<2-mo
3/2/2002 18:00	2	0.20	0.10	<2-mo
3/15/2002 22:00	7	0.90	0.30	<2-mo
3/17/2002 10:00	1	0.10	0.10	<2-mo
3/19/2002 17:00	19	0.80	0.10	<2-mo
3/25/2002 15:00	18	1.10	0.20	<2-mo
5/17/2002 16:00	11	1.30	0.20	4-mo, 11-hr
5/24/2002 16:00	1	0.10	0.10	<2-mo
5/27/2002 18:00	1	0.10	0.10	<2-mo
5/28/2002 13:00	1	0.10	0.10	<2-mo
5/30/2002 16:00	1	0.20	0.20	<2-mo
5/31/2002 20:00	2	0.80	0.70	3-mo, 2-hr
6/4/2002 16:00	1	0.20	0.20	<2-mo
6/5/2002 19:00	18	2.40	0.60	1.5-yr, 18-hr
6/27/2002 17:00	1	0.60	0.60	3-mo, 1-hr
7/9/2002 20:00	13	1.00	0.40	<2-mo
7/19/2002 16:00	1	0.30	0.30	<2-mo
7/20/2002 4:00	1	0.10	0.10	<2-mo
7/22/2002 20:00	1	0.10	0.10	<2-mo
7/23/2002 16:00	3	0.20	0.10	<2-mo
7/27/2002 11:00	2	0.50	0.40	<2-mo
7/29/2002 22:00	1	0.10	0.10	<2-mo
8/12/2002 16:00	1	0.10	0.10	<2-mo
8/14/2002 15:00	10	1.20	0.40	3-mo, 10-hr
8/18/2002 16:00	2	0.90	0.50	4-mo, 2-hr
8/24/2002 17:00	1	0.10	0.10	<2-mo
10/3/2002 17:00	1	0.30	0.30	<2-mo
10/4/2002 16:00	2	0.30	0.20	<2-mo
10/10/2002 18:00	14	0.90	0.20	<2-mo
10/13/2002 1:00	1	0.10	0.10	<2-mo
10/15/2002 17:00	15	1.00	0.20	<2-mo
10/19/2002 5:00	7	0.40	0.10	<2-mo
10/25/2002 15:00	7	0.90	0.30	<2-mo
10/27/2002 10:00	1	0.10	0.10	<2-mo
10/29/2002 9:00	6	0.50	0.10	<2-mo
10/30/2002 15:00	1	0.10	0.10	<2-mo
11/5/2002 15:00	6	0.50	0.10	<2-mo
11/10/2002 9:00	1	0.10	0.10	<2-mo
11/10/2002 22:00	3	0.70	0.50	<2-mo
11/15/2002 16:00	14	0.60	0.10	<2-mo
11/19/2002 5:00	1	0.10	0.10	<2-mo
11/21/2002 19:00	4	0.20	0.10	<2-mo
11/29/2002 15:00	1	0.10	0.10	<2-mo
1/2/2003 9:00	1	0.10	0.10	<2-mo
2/3/2003 22:00	6	0.30	0.10	<2-mo
2/9/2003 12:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
2/10/2003 14:00	1	0.10	0.10	<2-mo
2/13/2003 14:00	7	0.20	0.10	<2-mo
2/19/2003 17:00	5	0.30	0.10	<2-mo
2/20/2003 14:00	6	1.00	0.80	3-mo, 6-hr
2/21/2003 13:00	5	0.30	0.10	<2-mo
2/22/2003 6:00	16	0.70	0.20	<2-mo
2/24/2003 16:00	1	0.10	0.10	<2-mo
3/1/2003 13:00	1	0.10	0.10	<2-mo
3/5/2003 3:00	2	0.20	0.10	<2-mo
3/6/2003 8:00	10	0.30	0.10	<2-mo
3/13/2003 13:00	2	0.30	0.20	<2-mo
3/19/2003 23:00	7	0.40	0.20	<2-mo
3/20/2003 21:00	1	0.10	0.10	<2-mo
3/25/2003 20:00	5	0.30	0.10	<2-mo
3/29/2003 5:00	6	0.40	0.10	<2-mo
4/5/2003 2:00	3	0.40	0.20	<2-mo
4/7/2003 4:00	15	0.80	0.20	<2-mo
4/20/2003 21:00	5	0.60	0.20	<2-mo
4/25/2003 22:00	1	0.10	0.10	<2-mo
5/5/2003 2:00	14	1.20	0.40	3-mo, 14-hr
5/7/2003 9:00	1	0.40	0.40	<2-mo
5/7/2003 23:00	1	0.10	0.10	<2-mo
5/9/2003 10:00	7	0.70	0.40	<2-mo
5/10/2003 11:00	8	0.40	0.20	<2-mo
5/11/2003 7:00	1	0.10	0.10	<2-mo
5/15/2003 2:00	4	0.20	0.10	<2-mo
5/17/2003 13:00	4	0.20	0.10	<2-mo
5/20/2003 19:00	3	0.50	0.20	<2-mo
5/24/2003 3:00	1	0.10	0.10	<2-mo
5/25/2003 22:00	1	0.20	0.20	<2-mo
5/27/2003 23:00	1	0.20	0.20	<2-mo
5/31/2003 4:00	4	0.50	0.20	<2-mo
6/3/2003 6:00	7	0.60	0.20	<2-mo
6/7/2003 2:00	4	0.20	0.10	<2-mo
6/8/2003 17:00	3	1.10	0.90	5.5-mo, 3-hr
6/13/2003 15:00	2	0.20	0.10	<2-mo
6/14/2003 9:00	4	0.20	0.10	<2-mo
6/16/2003 7:00	7	0.20	0.10	<2-mo
6/17/2003 11:00	1	0.10	0.10	<2-mo
7/7/2003 22:00	9	0.20	0.10	<2-mo
7/8/2003 18:00	15	1.20	0.40	3-mo, 15-hr
7/10/2003 7:00	12	0.50	0.40	<2-mo
7/15/2003 21:00	4	2.00	1.30	3-yr, 4-hr
7/24/2003 19:00	1	0.10	0.10	<2-mo
7/28/2003 14:00	2	0.50	0.40	<2-mo
8/2/2003 5:00	8	0.60	0.20	<2-mo
8/27/2003 14:00	2	0.70	0.60	2-mo, 2-hr
8/29/2003 19:00	1	0.10	0.10	<2-mo
8/30/2003 11:00	1	0.10	0.10	<2-mo
9/1/2003 9:00	31	2.30	0.50	1-yr, 31-hr
9/19/2003 1:00	9	0.90	0.20	<2-mo
9/22/2003 9:00	9	1.00	0.20	2-mo, 9-hr
9/27/2003 5:00	6	1.00	0.40	3-mo, 6-hr
9/28/2003 18:00	1	0.10	0.10	<2-mo
10/14/2003 13:00	5	0.90	0.30	2-mo, 5-hr
10/17/2003 17:00	1	0.10	0.10	<2-mo
10/26/2003 10:00	17	0.50	0.20	<2-mo
10/28/2003 23:00	1	0.10	0.10	<2-mo
11/1/2003 8:00	5	0.30	0.20	<2-mo
12/1/2003 14:00	1	0.10	0.10	<2-mo
12/4/2003 17:00	28	0.70	0.10	<2-mo
12/6/2003 11:00	1	0.10	0.10	<2-mo
12/10/2003 9:00	10	0.60	0.20	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
12/14/2003 3:00	4	0.20	0.10	<2-mo
12/16/2003 10:00	13	0.30	0.10	<2-mo
12/23/2003 18:00	7	0.50	0.10	<2-mo
12/24/2003 22:00	1	0.10	0.10	<2-mo
12/30/2003 0:00	4	0.30	0.10	<2-mo
4/12/2004 13:00	35	2.00	0.20	7-mo, 35-hr
4/20/2004 17:00	1	0.10	0.10	<2-mo
4/21/2004 17:00	3	0.20	0.10	<2-mo
4/22/2004 13:00	11	0.90	0.30	<2-mo
4/30/2004 13:00	4	0.20	0.10	<2-mo
5/2/2004 4:00	10	0.60	0.10	<2-mo
5/14/2004 16:00	1	0.10	0.10	<2-mo
5/15/2004 10:00	5	0.40	0.10	<2-mo
5/17/2004 23:00	2	0.20	0.10	<2-mo
6/9/2004 23:00	10	0.50	0.20	<2-mo
6/11/2004 8:00	6	2.50	0.90	5-yr, 6-hr
6/12/2004 13:00	1	0.20	0.20	<2-mo
6/14/2004 2:00	2	0.80	0.70	3-mo, 2-hr
6/16/2004 14:00	10	0.30	0.10	<2-mo
6/17/2004 18:00	4	0.70	0.40	<2-mo
7/11/2004 20:00	3	0.60	0.50	<2-mo
7/17/2004 3:00	9	1.30	0.50	4-mo, 9-hr
7/22/2004 3:00	9	1.40	0.30	6-mo, 9-hr
7/26/2004 0:00	8	2.40	1.00	3-yr, 8-hr
7/27/2004 2:00	2	0.30	0.20	<2-mo
7/31/2004 3:00	10	1.60	0.70	8.5-mo, 10-hr
9/17/2004 7:00	12	1.80	0.20	9-mo, 12-hr
9/29/2004 12:00	1	0.10	0.10	<2-mo
10/12/2004 12:00	1	0.10	0.10	<2-mo
10/13/2004 9:00	3	0.80	0.40	2-mo, 3-hr
10/15/2004 5:00	14	0.40	0.20	<2-mo
10/18/2004 13:00	10	1.80	0.40	11-mo, 10-hr
10/19/2004 13:00	1	0.10	0.10	<2-mo
10/20/2004 10:00	1	0.10	0.10	<2-mo
10/23/2004 21:00	2	0.30	0.20	<2-mo
10/27/2004 10:00	1	0.10	0.10	<2-mo
10/30/2004 12:00	1	0.10	0.10	<2-mo
11/2/2004 14:00	8	0.30	0.20	<2-mo
11/4/2004 8:00	3	0.60	0.30	<2-mo
11/11/2004 21:00	8	0.80	0.20	<2-mo
11/16/2004 7:00	2	0.20	0.10	<2-mo
11/17/2004 17:00	5	0.60	0.30	<2-mo
11/19/2004 5:00	11	0.60	0.30	<2-mo
11/24/2004 9:00	16	0.50	0.10	<2-mo
11/28/2004 0:00	1	0.10	0.10	<2-mo
11/30/2004 16:00	16	0.80	0.10	<2-mo
12/7/2004 3:00	8	0.30	0.10	<2-mo
12/9/2004 17:00	7	0.50	0.20	<2-mo
12/11/2004 15:00	1	0.10	0.10	<2-mo
12/14/2004 12:00	1	0.10	0.10	<2-mo
12/17/2004 10:00	1	0.10	0.10	<2-mo
12/19/2004 12:00	1	0.10	0.10	<2-mo
12/22/2004 5:00	29	2.20	0.20	1-yr, 29-hr
1/1/2005 23:00	1	0.10	0.10	<2-mo
1/3/2005 7:00	20	1.20	0.20	2-mo, 20-hr
1/4/2005 23:00	35	3.60	0.40	5-yr, 35-hr
1/8/2005 2:00	5	0.20	0.10	<2-mo
1/11/2005 5:00	19	1.70	0.30	6-mo, 19-hr
1/13/2005 16:00	8	0.50	0.10	<2-mo
1/16/2005 13:00	1	0.10	0.10	<2-mo
1/19/2005 20:00	1	0.10	0.10	<2-mo
1/20/2005 21:00	1	0.10	0.10	<2-mo
1/22/2005 9:00	2	0.20	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
1/29/2005 15:00	12	0.20	0.10	<2-mo
2/8/2005 4:00	1	0.10	0.10	<2-mo
2/9/2005 13:00	1	0.10	0.10	<2-mo
2/10/2005 3:00	1	0.10	0.10	<2-mo
2/14/2005 11:00	2	0.20	0.10	<2-mo
2/16/2005 7:00	1	0.10	0.10	<2-mo
2/24/2005 7:00	10	0.20	0.10	<2-mo
2/28/2005 13:00	8	0.30	0.10	<2-mo
3/7/2005 18:00	3	0.70	0.40	<2-mo
3/19/2005 16:00	7	0.40	0.20	<2-mo
3/22/2005 23:00	14	0.40	0.10	<2-mo
3/25/2005 5:00	1	0.10	0.10	<2-mo
3/25/2005 18:00	1	0.10	0.10	<2-mo
3/26/2005 12:00	1	0.10	0.10	<2-mo
3/28/2005 2:00	15	1.40	0.40	4-mo, 15-hr
4/1/2005 19:00	23	1.40	0.10	3-mo, 23-hr
4/13/2005 4:00	3	0.30	0.10	<2-mo
4/22/2005 10:00	2	0.50	0.30	<2-mo
4/23/2005 1:00	23	1.50	0.30	4-mo, 23-hr
4/24/2005 17:00	3	0.20	0.10	<2-mo
4/26/2005 18:00	6	0.20	0.10	<2-mo
5/7/2005 0:00	1	0.10	0.10	<2-mo
5/11/2005 22:00	4	0.30	0.10	<2-mo
5/13/2005 21:00	11	0.80	0.30	<2-mo
5/14/2005 19:00	1	0.10	0.10	<2-mo
5/19/2005 15:00	9	0.60	0.20	<2-mo
5/21/2005 13:00	1	0.10	0.10	<2-mo
5/28/2005 5:00	14	0.50	0.20	<2-mo
5/30/2005 22:00	1	0.10	0.10	<2-mo
6/3/2005 9:00	1	0.10	0.10	<2-mo
6/30/2005 14:00	13	0.50	0.20	<2-mo
7/5/2005 13:00	1	0.10	0.10	<2-mo
7/7/2005 15:00	1	0.10	0.10	<2-mo
7/12/2005 15:00	1	0.10	0.10	<2-mo
7/13/2005 16:00	1	0.10	0.10	<2-mo
7/14/2005 10:00	1	0.10	0.10	<2-mo
7/16/2005 2:00	10	0.40	0.30	<2-mo
7/18/2005 8:00	1	0.10	0.10	<2-mo
7/20/2005 19:00	1	0.30	0.30	<2-mo
8/4/2005 18:00	1	0.20	0.20	<2-mo
8/5/2005 19:00	1	0.10	0.10	<2-mo
8/10/2005 19:00	2	0.80	0.50	3-mo, 2-hr
8/16/2005 7:00	1	0.10	0.10	<2-mo
8/18/2005 17:00	7	0.40	0.20	<2-mo
8/20/2005 19:00	1	0.10	0.10	<2-mo
8/29/2005 6:00	2	1.20	1.10	9-mo, 2-hr
8/30/2005 9:00	26	3.30	0.80	5-yr, 26-hr
9/16/2005 6:00	1	0.10	0.10	<2-mo
9/20/2005 2:00	3	0.30	0.10	<2-mo
9/23/2005 7:00	1	0.10	0.10	<2-mo
9/24/2005 10:00	3	1.40	0.70	1-yr, 3-hr
9/26/2005 5:00	8	0.50	0.10	<2-mo
9/29/2005 5:00	4	0.60	0.40	<2-mo
10/7/2005 10:00	20	0.50	0.10	<2-mo
10/9/2005 7:00	1	0.10	0.10	<2-mo
10/15/2005 12:00	1	0.10	0.10	<2-mo
10/18/2005 8:00	1	0.10	0.10	<2-mo
10/20/2005 9:00	1	0.10	0.10	<2-mo
10/21/2005 0:00	36	1.80	0.20	5.5-mo, 36-hr
10/24/2005 0:00	4	0.20	0.10	<2-mo
10/24/2005 17:00	1	0.10	0.10	<2-mo
10/25/2005 6:00	22	0.90	0.40	<2-mo
11/1/2005 17:00	1	0.10	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
11/8/2005 8:00	6	0.50	0.20	<2-mo
11/9/2005 4:00	2	0.90	0.60	4-mo, 2-hr
11/15/2005 0:00	12	1.50	0.40	5.5-mo, 12-hr
11/28/2005 23:00	7	0.60	0.10	<2-mo
12/4/2005 0:00	1	0.10	0.10	<2-mo
12/8/2005 20:00	2	0.20	0.10	<2-mo
12/15/2005 6:00	8	0.40	0.10	<2-mo
12/16/2005 12:00	1	0.10	0.10	<2-mo
12/25/2005 3:00	12	0.50	0.20	<2-mo
12/28/2005 17:00	2	0.20	0.10	<2-mo
12/31/2005 4:00	1	0.10	0.10	<2-mo
1/2/2006 4:00	9	0.80	0.20	<2-mo
1/3/2006 2:00	1	0.10	0.10	<2-mo
1/11/2006 5:00	2	0.20	0.10	<2-mo
1/13/2006 22:00	7	0.30	0.10	<2-mo
1/17/2006 13:00	12	0.70	0.20	<2-mo
1/18/2006 15:00	1	0.10	0.10	<2-mo
1/22/2006 23:00	9	0.70	0.10	<2-mo
1/29/2006 10:00	1	0.10	0.10	<2-mo
2/3/2006 3:00	10	0.30	0.10	<2-mo
2/4/2006 8:00	5	0.60	0.20	<2-mo
2/17/2006 2:00	2	0.20	0.10	<2-mo
3/6/2006 18:00	1	0.10	0.10	<2-mo
3/8/2006 15:00	4	0.30	0.10	<2-mo
3/11/2006 12:00	24	1.60	0.30	5-mo, 24-hr
3/12/2006 23:00	1	0.20	0.20	<2-mo
3/13/2006 13:00	9	0.40	0.20	<2-mo
4/7/2006 19:00	6	0.60	0.30	<2-mo
4/14/2006 7:00	29	1.20	0.20	2-mo, 29-hr
4/16/2006 1:00	9	0.20	0.10	<2-mo
4/17/2006 6:00	8	0.20	0.10	<2-mo
4/20/2006 11:00	1	0.10	0.10	<2-mo
4/21/2006 18:00	3	0.30	0.10	<2-mo
4/22/2006 10:00	1	0.10	0.10	<2-mo
4/24/2006 18:00	1	0.10	0.10	<2-mo
4/25/2006 18:00	3	0.20	0.10	<2-mo
5/2/2006 23:00	1	0.30	0.30	<2-mo
5/10/2006 21:00	1	0.10	0.10	<2-mo
5/12/2006 0:00	1	0.10	0.10	<2-mo
5/12/2006 17:00	3	0.20	0.10	<2-mo
5/13/2006 15:00	1	0.10	0.10	<2-mo
5/14/2006 13:00	1	0.10	0.10	<2-mo
5/15/2006 19:00	22	0.30	0.10	<2-mo
5/17/2006 18:00	10	0.80	0.20	<2-mo
5/19/2006 2:00	4	0.20	0.10	<2-mo
5/25/2006 3:00	1	0.10	0.10	<2-mo
5/25/2006 22:00	1	0.30	0.30	<2-mo
5/26/2006 14:00	4	0.20	0.10	<2-mo
5/31/2006 18:00	1	0.30	0.30	<2-mo
6/1/2006 12:00	10	0.50	0.30	<2-mo
6/2/2006 12:00	8	0.80	0.20	<2-mo
6/7/2006 19:00	5	1.40	0.80	8.5-mo, 5-hr
6/9/2006 0:00	1	0.10	0.10	<2-mo
6/10/2006 14:00	1	0.10	0.10	<2-mo
6/19/2006 11:00	1	0.10	0.10	<2-mo
6/21/2006 9:00	6	0.70	0.50	<2-mo
6/22/2006 19:00	25	1.70	1.00	5-mo, 25-hr
6/27/2006 19:00	2	0.60	0.30	<2-mo
6/28/2006 23:00	2	0.20	0.10	<2-mo
7/3/2006 9:00	13	0.90	0.60	<2-mo
7/4/2006 12:00	18	0.70	0.30	<2-mo
7/12/2006 4:00	10	0.70	0.40	<2-mo
7/13/2006 6:00	10	1.70	1.00	9-mo, 10-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
7/14/2006 17:00	7	0.40	0.20	<2-mo
7/18/2006 19:00	1	0.10	0.10	<2-mo
7/19/2006 11:00	1	0.10	0.10	<2-mo
7/20/2006 15:00	1	0.10	0.10	<2-mo
7/22/2006 2:00	1	0.10	0.10	<2-mo
8/3/2006 18:00	1	0.10	0.10	<2-mo
8/7/2006 17:00	1	0.20	0.20	<2-mo
8/8/2006 8:00	1	0.10	0.10	<2-mo
8/14/2006 23:00	3	0.80	0.70	2-mo, 3-hr
8/18/2006 13:00	8	1.00	0.90	2-mo, 8-hr
8/27/2006 1:00	17	0.30	0.10	<2-mo
8/28/2006 11:00	20	1.30	0.40	3-mo, 20-hr
9/1/2006 5:00	14	0.40	0.10	<2-mo
9/5/2006 15:00	6	0.60	0.30	<2-mo
9/12/2006 9:00	29	2.10	0.40	9-mo, 29-hr
9/18/2006 18:00	6	0.50	0.30	<2-mo
9/23/2006 1:00	14	1.10	0.40	2-mo, 14-hr
9/28/2006 2:00	12	1.10	0.50	2-mo, 12-hr
9/30/2006 11:00	1	0.10	0.10	<2-mo
10/4/2006 13:00	16	1.70	0.40	8-mo, 16-hr
10/5/2006 20:00	1	0.10	0.10	<2-mo
1/4/2007 23:00	16	0.70	0.40	<2-mo
1/6/2007 6:00	1	0.10	0.10	<2-mo
1/7/2007 16:00	6	0.40	0.20	<2-mo
1/12/2007 1:00	1	0.10	0.10	<2-mo
1/13/2007 0:00	20	1.10	0.20	<2-mo
1/14/2007 10:00	11	0.40	0.10	<2-mo
1/15/2007 12:00	12	1.00	0.50	<2-mo
1/22/2007 17:00	5	0.30	0.10	<2-mo
3/1/2007 18:00	7	0.90	0.30	<2-mo
3/7/2007 19:00	1	0.10	0.10	<2-mo
3/10/2007 15:00	1	0.10	0.10	<2-mo
3/14/2007 8:00	32	1.90	0.40	8-mo, 32-hr
3/19/2007 14:00	2	0.30	0.20	<2-mo
3/22/2007 13:00	1	0.10	0.10	<2-mo
3/23/2007 5:00	27	1.20	0.20	2-mo, 27-hr
3/31/2007 15:00	1	0.10	0.10	<2-mo
4/1/2007 5:00	11	0.70	0.20	<2-mo
4/7/2007 13:00	1	0.10	0.10	<2-mo
4/11/2007 14:00	11	0.70	0.20	<2-mo
4/14/2007 16:00	9	0.50	0.20	<2-mo
4/24/2007 1:00	1	0.20	0.20	<2-mo
4/25/2007 10:00	3	0.20	0.10	<2-mo
4/26/2007 22:00	2	0.20	0.10	<2-mo
4/28/2007 23:00	3	0.20	0.10	<2-mo
5/16/2007 7:00	4	0.60	0.20	<2-mo
5/20/2007 19:00	1	0.10	0.10	<2-mo
5/27/2007 16:00	1	0.10	0.10	<2-mo
5/31/2007 12:00	1	0.10	0.10	<2-mo
6/3/2007 21:00	1	0.10	0.10	<2-mo
6/4/2007 19:00	1	0.10	0.10	<2-mo
6/8/2007 14:00	1	0.10	0.10	<2-mo
6/13/2007 20:00	2	0.60	0.40	<2-mo
6/19/2007 16:00	1	0.10	0.10	<2-mo
6/21/2007 10:00	1	0.20	0.20	<2-mo
6/22/2007 15:00	1	0.10	0.10	<2-mo
6/25/2007 16:00	2	0.70	0.60	2-mo, 2-hr
6/27/2007 18:00	1	0.10	0.10	<2-mo
6/28/2007 22:00	1	0.90	0.90	8-mo, 1-hr
6/29/2007 17:00	1	0.10	0.10	<2-mo
7/3/2007 14:00	1	0.10	0.10	<2-mo
7/4/2007 17:00	2	0.40	0.30	<2-mo
7/5/2007 16:00	4	0.80	0.50	2-mo, 4-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
7/10/2007 13:00	2	0.70	0.60	2-mo, 2-hr
7/13/2007 15:00	1	0.10	0.10	<2-mo
7/17/2007 17:00	7	1.30	0.50	5-mo, 7-hr
7/19/2007 5:00	13	0.50	0.20	<2-mo
7/27/2007 5:00	14	2.20	0.90	1.5-yr, 14-hr
4/4/2008 3:00	18	0.70	0.20	<2-mo
4/5/2008 16:00	1	0.10	0.10	<2-mo
4/11/2008 9:00	8	0.20	0.10	<2-mo
4/13/2008 10:00	1	0.10	0.10	<2-mo
4/20/2008 17:00	1	0.10	0.10	<2-mo
4/28/2008 4:00	26	0.80	0.10	<2-mo
5/1/2008 12:00	1	0.10	0.10	<2-mo
5/2/2008 18:00	1	0.10	0.10	<2-mo
5/3/2008 7:00	13	0.50	0.20	<2-mo
5/7/2008 23:00	35	0.50	0.10	<2-mo
5/9/2008 21:00	1	0.10	0.10	<2-mo
5/11/2008 8:00	8	0.40	0.10	<2-mo
5/12/2008 3:00	2	0.20	0.10	<2-mo
5/14/2008 14:00	4	0.20	0.10	<2-mo
5/15/2008 21:00	14	1.80	0.50	9-mo, 14-hr
5/18/2008 4:00	4	0.40	0.20	<2-mo
5/20/2008 1:00	8	0.40	0.10	<2-mo
5/26/2008 11:00	1	0.10	0.10	<2-mo
5/31/2008 3:00	8	0.70	0.30	<2-mo
6/3/2008 14:00	23	3.40	0.70	5-yr, 23-hr
6/10/2008 6:00	4	0.80	0.40	2-mo, 4-hr
6/13/2008 20:00	6	0.80	0.30	<2-mo
6/21/2008 23:00	1	0.20	0.20	<2-mo
8/5/2008 6:00	3	0.20	0.10	<2-mo
8/10/2008 12:00	1	0.10	0.10	<2-mo
8/14/2008 10:00	1	0.10	0.10	<2-mo
8/14/2008 22:00	2	0.20	0.10	<2-mo
8/15/2008 13:00	1	0.10	0.10	<2-mo
8/24/2008 22:00	2	0.80	0.60	3-mo, 2-hr
8/27/2008 6:00	16	1.00	0.10	<2-mo
8/28/2008 17:00	1	0.10	0.10	<2-mo
9/6/2008 14:00	1	0.10	0.10	<2-mo
9/9/2008 6:00	1	0.10	0.10	<2-mo
9/12/2008 11:00	1	0.40	0.40	<2-mo
9/15/2008 13:00	1	0.10	0.10	<2-mo
9/30/2008 8:00	2	0.20	0.10	<2-mo
10/8/2008 10:00	8	0.70	0.30	<2-mo
10/24/2008 20:00	11	0.50	0.10	<2-mo
5/1/2009 22:00	1	0.10	0.10	<2-mo
5/6/2009 13:00	4	1.10	0.30	4-mo, 4-hr
5/13/2009 13:00	2	0.30	0.20	<2-mo
5/14/2009 2:00	1	0.10	0.10	<2-mo
5/26/2009 21:00	1	0.50	0.50	<2-mo
5/27/2009 19:00	6	0.40	0.20	<2-mo
5/30/2009 3:00	1	0.10	0.10	<2-mo
6/1/2009 19:00	11	1.50	0.90	6-mo, 11-hr
6/2/2009 18:00	1	0.20	0.20	<2-mo
6/3/2009 7:00	1	0.10	0.10	<2-mo
6/10/2009 11:00	15	1.00	0.30	<2-mo
4/6/2010 2:00	1	0.20	0.20	<2-mo
4/16/2010 21:00	2	0.20	0.10	<2-mo
4/24/2010 23:00	18	0.90	0.30	<2-mo
4/26/2010 9:00	16	0.50	0.20	<2-mo
5/2/2010 7:00	17	1.30	0.20	3-mo, 17-hr
5/8/2010 2:00	2	0.20	0.10	<2-mo
5/11/2010 7:00	6	0.90	0.30	2-mo, 6-hr
5/12/2010 0:00	1	0.10	0.10	<2-mo
5/12/2010 13:00	17	1.10	0.50	2-mo, 17-hr

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event Date/Time	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
5/17/2010 9:00	4	0.30	0.10	<2-mo
5/18/2010 10:00	1	0.10	0.10	<2-mo
5/21/2010 10:00	19	1.10	0.50	<2-mo
5/28/2010 6:00	2	0.30	0.20	<2-mo
6/2/2010 22:00	2	0.30	0.20	<2-mo
6/3/2010 14:00	1	0.10	0.10	<2-mo
6/5/2010 11:00	1	0.40	0.40	<2-mo
6/9/2010 2:00	12	0.90	0.20	<2-mo
6/11/2010 15:00	4	0.30	0.20	<2-mo
6/12/2010 11:00	1	0.10	0.10	<2-mo
6/13/2010 6:00	2	0.30	0.20	<2-mo
6/14/2010 18:00	10	1.10	0.40	3-mo, 10-hr
6/16/2010 1:00	1	0.10	0.10	<2-mo
6/27/2010 1:00	28	2.00	0.50	9-mo, 28-hr
7/9/2010 14:00	3	0.50	0.20	<2-mo
7/10/2010 13:00	1	0.10	0.10	<2-mo
7/12/2010 9:00	11	2.00	1.70	1-yr, 11-hr
7/13/2010 14:00	6	0.30	0.10	<2-mo
7/16/2010 8:00	1	0.20	0.20	<2-mo
7/18/2010 18:00	6	0.60	0.20	<2-mo
7/25/2010 11:00	2	0.20	0.10	<2-mo
8/4/2010 6:00	26	2.30	1.10	1-yr, 26-hr
8/10/2010 17:00	1	0.10	0.10	<2-mo
8/11/2010 5:00	11	0.90	0.40	<2-mo
8/14/2010 19:00	3	0.60	0.40	<2-mo
8/21/2010 18:00	12	1.80	1.00	9-mo, 12-hr
9/16/2010 8:00	2	0.20	0.10	<2-mo
9/27/2010 4:00	6	0.30	0.10	<2-mo
9/27/2010 23:00	11	0.60	0.20	<2-mo
10/2/2010 21:00	2	0.20	0.10	<2-mo
10/5/2010 17:00	1	0.10	0.10	<2-mo
10/15/2010 8:00	3	0.20	0.10	<2-mo
10/19/2010 5:00	1	0.10	0.10	<2-mo
10/26/2010 16:00	5	1.00	0.40	3-mo, 5-hr
11/16/2010 14:00	15	0.70	0.20	<2-mo
11/23/2010 5:00	3	0.30	0.10	<2-mo
11/24/2010 20:00	32	2.70	0.50	1.5-yr, 32-hr
11/30/2010 6:00	19	1.10	0.10	<2-mo
12/6/2010 10:00	1	0.10	0.10	<2-mo
12/11/2010 23:00	14	0.60	0.10	<2-mo
12/21/2010 15:00	1	0.10	0.10	<2-mo
12/23/2010 14:00	1	0.10	0.10	<2-mo
12/26/2010 9:00	1	0.10	0.10	<2-mo
12/30/2010 6:00	3	0.20	0.10	<2-mo
1/1/2011 5:00	10	0.60	0.20	<2-mo
1/8/2011 9:00	1	0.10	0.10	<2-mo
1/11/2011 17:00	1	0.10	0.10	<2-mo
1/15/2011 13:00	1	0.10	0.10	<2-mo
1/18/2011 17:00	5	0.20	0.10	<2-mo
1/24/2011 20:00	18	0.50	0.10	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
2/1/2011 7:00	21	1.00	0.20	<2-mo
2/5/2011 15:00	1	0.10	0.10	<2-mo
2/11/2011 14:00	1	0.10	0.10	<2-mo
2/20/2011 23:00	27	1.60	0.30	4.5-mo, 27-hr
2/24/2011 23:00	16	1.40	0.20	4-mo, 16-hr
2/28/2011 1:00	9	0.50	0.20	<2-mo
3/4/2011 13:00	2	0.20	0.10	<2-mo
3/5/2011 2:00	26	0.90	0.20	<2-mo
3/6/2011 15:00	1	0.10	0.10	<2-mo
3/9/2011 3:00	35	1.40	0.20	3-mo, 35-hr
3/11/2011 1:00	1	0.10	0.10	<2-mo
3/15/2011 19:00	2	0.20	0.10	<2-mo
3/21/2011 4:00	1	0.50	0.50	<2-mo
3/21/2011 18:00	14	0.80	0.20	<2-mo
3/24/2011 0:00	1	0.10	0.10	<2-mo
3/30/2011 17:00	1	0.10	0.10	<2-mo
3/31/2011 16:00	1	0.10	0.10	<2-mo
4/2/2011 13:00	1	0.10	0.10	<2-mo
4/4/2011 16:00	13	1.40	0.70	4-mo, 13-hr
5/1/2011 17:00	1	0.10	0.10	<2-mo
5/2/2011 15:00	14	2.00	0.30	1-yr, 14-hr
5/5/2011 5:00	1	0.10	0.10	<2-mo
5/7/2011 12:00	3	0.40	0.20	<2-mo
5/8/2011 6:00	1	0.10	0.10	<2-mo
5/12/2011 17:00	1	0.10	0.10	<2-mo
5/14/2011 10:00	1	0.10	0.10	<2-mo
5/15/2011 8:00	4	0.30	0.10	<2-mo
5/16/2011 22:00	27	0.90	0.20	<2-mo
5/19/2011 9:00	5	0.30	0.10	<2-mo
5/20/2011 4:00	1	0.10	0.10	<2-mo
5/22/2011 14:00	11	1.20	0.60	3-mo, 11-hr
5/23/2011 12:00	11	0.40	0.20	<2-mo
5/25/2011 19:00	1	0.10	0.10	<2-mo
5/28/2011 5:00	1	0.10	0.10	<2-mo
6/3/2011 16:00	1	0.10	0.10	<2-mo
6/4/2011 20:00	5	1.30	1.10	6-mo, 5-hr
6/5/2011 13:00	1	0.10	0.10	<2-mo
6/7/2011 13:00	2	0.50	0.40	<2-mo
6/10/2011 21:00	11	0.50	0.30	<2-mo
6/17/2011 9:00	17	0.70	0.30	<2-mo
6/18/2011 13:00	2	0.20	0.10	<2-mo
6/19/2011 20:00	1	0.10	0.10	<2-mo
6/20/2011 16:00	1	0.10	0.10	<2-mo
6/21/2011 19:00	2	0.20	0.10	<2-mo
6/23/2011 1:00	12	0.30	0.20	<2-mo
6/25/2011 13:00	1	0.10	0.10	<2-mo
6/27/2011 20:00	3	0.60	0.30	<2-mo
7/2/2011 13:00	1	0.10	0.10	<2-mo
7/8/2011 8:00	1	0.10	0.10	<2-mo
7/11/2011 15:00	8	1.20	0.70	4-mo, 8-hr
7/18/2011 19:00	13	2.90	2.40	5-yr, 13-hr
7/20/2011 17:00	1	0.40	0.40	<2-mo
7/21/2011 5:00	4	0.20	0.10	<2-mo
7/23/2011 18:00	21	0.90	0.40	<2-mo
7/25/2011 10:00	7	0.20	0.10	<2-mo
7/29/2011 21:00	16	1.20	1.00	3-mo, 16-hr
8/3/2011 6:00	3	0.40	0.30	<2-mo
8/7/2011 18:00	2	0.40	0.30	<2-mo
8/9/2011 0:00	1	0.10	0.10	<2-mo
8/10/2011 0:00	4	0.20	0.10	<2-mo
8/21/2011 7:00	2	0.30	0.20	<2-mo
8/24/2011 7:00	2	0.50	0.40	<2-mo

**City of Lancaster - LTCP Phase-II  
Historical Rainfall Data - Rainfall Events Summary**

Event DateTime	Duration (hrs)	Total Rain (in)	Max Intensity (in/hr)	Return Period
8/25/2011 3:00	5	1.20	0.60	5-mo, 5-hr
9/4/2011 16:00	9	0.80	0.40	<2-mo
9/6/2011 4:00	1	0.10	0.10	<2-mo
9/6/2011 16:00	1	0.10	0.10	<2-mo
9/7/2011 10:00	20	0.60	0.10	<2-mo
9/14/2011 13:00	17	0.50	0.10	<2-mo
9/19/2011 17:00	4	0.40	0.20	<2-mo
9/20/2011 12:00	1	0.10	0.10	<2-mo
9/26/2011 11:00	6	0.70	0.30	<2-mo
9/29/2011 23:00	2	0.30	0.20	<2-mo
10/3/2011 10:00	8	0.20	0.10	<2-mo
10/12/2011 5:00	9	0.40	0.10	<2-mo
10/13/2011 23:00	7	0.20	0.10	<2-mo
10/18/2011 9:00	1	0.10	0.10	<2-mo
10/19/2011 0:00	21	2.00	0.40	9-mo, 21-hr
10/20/2011 10:00	7	0.20	0.10	<2-mo
10/21/2011 13:00	1	0.10	0.10	<2-mo
10/24/2011 12:00	1	0.10	0.10	<2-mo
10/27/2011 0:00	16	0.60	0.10	<2-mo
11/2/2011 18:00	1	0.10	0.10	<2-mo
11/13/2011 6:00	1	0.20	0.20	<2-mo
11/14/2011 16:00	20	1.00	0.20	<2-mo
11/16/2011 10:00	3	0.40	0.20	<2-mo
11/20/2011 17:00	7	0.40	0.20	<2-mo
11/22/2011 3:00	14	1.10	0.30	2-mo, 14-hr
11/27/2011 8:00	65	2.00	0.10	6-mo, 65-hr
12/1/2011 8:00	1	0.20	0.20	<2-mo
12/5/2011 7:00	21	1.60	0.20	5-mo, 21-hr
12/14/2011 6:00	6	0.30	0.10	<2-mo
12/15/2011 8:00	8	0.20	0.10	<2-mo
12/20/2011 1:00	1	0.10	0.10	<2-mo
12/21/2011 1:00	11	0.50	0.10	<2-mo
12/22/2011 16:00	7	0.60	0.20	<2-mo
12/27/2011 11:00	8	0.50	0.10	<2-mo
12/30/2011 2:00	1	0.10	0.10	<2-mo
12/30/2011 22:00	1	0.10	0.10	<2-mo
1/11/2012 9:00	6	0.30	0.10	<2-mo
1/12/2012 2:00	1	0.10	0.10	<2-mo
1/12/2012 16:00	1	0.10	0.10	<2-mo
1/16/2012 13:00	1	0.10	0.10	<2-mo
1/17/2012 4:00	9	0.70	0.20	<2-mo
1/21/2012 0:00	3	0.20	0.10	<2-mo
1/22/2012 18:00	16	0.50	0.10	<2-mo
1/26/2012 6:00	18	1.70	0.30	6-mo, 18-hr
1/31/2012 22:00	1	0.10	0.10	<2-mo
2/4/2012 13:00	1	0.10	0.10	<2-mo
2/8/2012 8:00	4	0.20	0.10	<2-mo
2/11/2012 10:00	1	0.10	0.10	<2-mo
2/14/2012 13:00	1	0.10	0.10	<2-mo
2/16/2012 7:00	3	0.30	0.10	<2-mo
2/21/2012 11:00	1	0.10	0.10	<2-mo
2/29/2012 6:00	2	0.50	0.30	<2-mo

**Appendix B**

December 6, 2013 Response Letter  
to OEPA on the Development of the  
Typical Year



ARCADIS U.S., Inc.  
100 E Campus View Blvd  
Suite 200  
Columbus  
Ohio 43235-1447  
Tel 614 985 9100  
Fax 614 985 9170  
[www.arcadis-us.com](http://www.arcadis-us.com)

Mr. Paul L. Vandermeer  
Ohio EPA  
Division of Surface Water  
Central District Office  
Compliance and Enforcement Unit  
P.O. Box 1049  
Columbus, Ohio 43216-1049

Subject:  
Typical Year Rainfall Study  
Response to OEPA Comments

Date:  
December 6, 2013

Dear Mr. Vandermeer:

Contact:  
Tom Bulcher

We have reviewed your questions regarding the Typical Year and other items discussed during our August 12, 2013 progress meeting. The follow are your original questions and the our responses (in italics).

Phone:  
(614) 985-9202

1. **Comment:** The analysis is based on precipitation data for the previous 47 years. All data presented was collected at the City's water treatment plant as this monitoring station is located nearest to the City's combined sewer area. Unfortunately, there are some significant gaps in the dataset from this site. More than half of the years considered have incomplete data with seven of the last 10 years having the biggest gaps. Can the City look into including data from other nearby stations to try and fill in some of the gaps? A discussion of any limitations associated with any additional data should also be included.

Email:  
[tom.bulcher@arcadis-us.com](mailto:tom.bulcher@arcadis-us.com)

Our ref:  
00491066.0000

**Response:** *We have investigated both the gaps in the data from the City's water treatment plant and additional historic rainfall data from nearby gauges. The gaps in the data are all tagged "9999" which correlates to missing data, rather than months with no recordable rainfall. Figure 1, attached, shows the locations of neighboring rain gauges used in this secondary analysis. The Circleville and Logan rain gauges were selected based on their relative proximity to Lancaster as well as their topography. The Circleville rain gauge contains data from January 1966 to October 2006. The Logan rain gauge contains data from January 1966 to December 2011. Unfortunately, both the Circleville and Logan rain gauges also had a significant number of recent months with missing data. Tables 1 and 2 provide a summary of the Circleville and Logan rainfall events.*

Imagine the result

Moving on, the rain gauge in Newark and the rain gauge in Columbus were evaluated. The Newark rain gauge contains data from January 1996 to June 2007. As with the above rain gauges and the Lancaster rain gauge, there are random data gaps and a significant portion of recent months missing data. The Columbus rain gauge contains data from January 1966 to July 2012. The Columbus rain gauge does not have any months in the dataset with missing data. Tables 3 and 4 provide a summary of the Newark and Columbus rainfall events.

Table 5 summarizes the average annual rainfall and average number of events for each rain gauge, including Lancaster.

**Table 5: Summary of Rain Gauge Statistics**

Rain Gauge Location	Annual Average Rainfall			
	Amount		Events	
	Inches	Difference from Lancaster	Number	Difference from Lancaster
Circleville	36.9	0.5%	77	3%
Logan	34.8	5%	64	19%
Newark	40.9	11%	88	11%
Columbus	39.1	7%	67	15%
Lancaster	36.7	-	79	-

Since the Columbus rain gauge data was complete, individual months from that dataset were used to fill the gaps in the Lancaster rainfall analysis. In this scenario, the average annual rainfall increases slightly to 37.0 inches, and the average number of events drops from 79 events to 77 events. Table 6 provides the compiled rainfall events; the filled months are highlighted in yellow.

With the gaps in the Lancaster rain gauge data filled with Columbus rain gauge data, change in average annual rainfall and average number of events does not significantly change. The typical year, as previously compiled, closely matches both the average annual rainfall volume and

*number of events. Therefore, we do not believe that changes to the Typical Year would have any impact on the model results and are warranted or necessary.*

2. **Comment:** We discussed the City's efforts to inspect CSOs in determining activation occurrence. We believe Lancaster should resume the practice of using wooden blocks to identify when CSO activations have taken place. We want to make sure the data for number of occurrences reported by the City is as accurate as possible to allow for better comparisons with model output.

**Response:** *As noted in the City's letter dated September 5, 2013, the City has reinstalled wooden blocks in their remaining CSOs.*

**Comment:** Ideally we would like to see a comparison of the baseline model to the data that was collected during the flow monitoring period. Moving forward the occurrence data (that should be collected by using some type of passive monitoring system) will be important in the future to verify that the projects are having the projected reduction in overflow and also in calibrating the model for post construction monitoring. It is an easy way to see how many times the model predicts overflows at each outfall and how many times those overflows actually activated.

**Response:** *As requested, we have compiled a table (Table 7) comparing the observed CSO activation data (block inspections) to the model predicted CSO activations during the flow monitoring period (March through August 2012). We have also included the monitored flow data at CSOs 1008, 1009, 1027 and 1029 for comparison purposes.*

*Upon initial review, there are 16 instances across 26 events at the 11 CSOs in which the block data and model predictions do not agree. These events are highlighted in yellow. This amounts to a percent difference of 6%, which is within a reasonable range of error. With the planned closures at CSOs 1011, 1014, 1019, 1026, 1027, 1029 and 1033, the calculated error at the remaining CSOs drops to 2% (two instances across 26 events at four CSOs).*

*The differences at CSO 1033 were further investigated. In these examples, the block data predicts an overflow, but the model does not. In the case of CSO 1033, the depth of flow at the temporary flow monitor just upstream of the regulator was compared to the elevation of the overflow control structure.*

*In the majority of cases, the upstream flow monitor did not record a depth significant enough to exceed the overflow control weir elevation.*

3. **Comment:** As mentioned during the meeting a financial strategy and capability assessment may take into account current or planned sewer rates, stormwater fees, other revenue, and the costs, schedules, anticipated financial impacts to the community of other planned stormwater or wastewater expenditures, and other relevant factors impacting the utility's rate base as described in the "CSO Guidance for Financial Capability Assessment and Schedule Development," (EPA 832-B-97-004).

**Response:** Agreed.

Sincerely,

ARCADIS U.S., Inc.

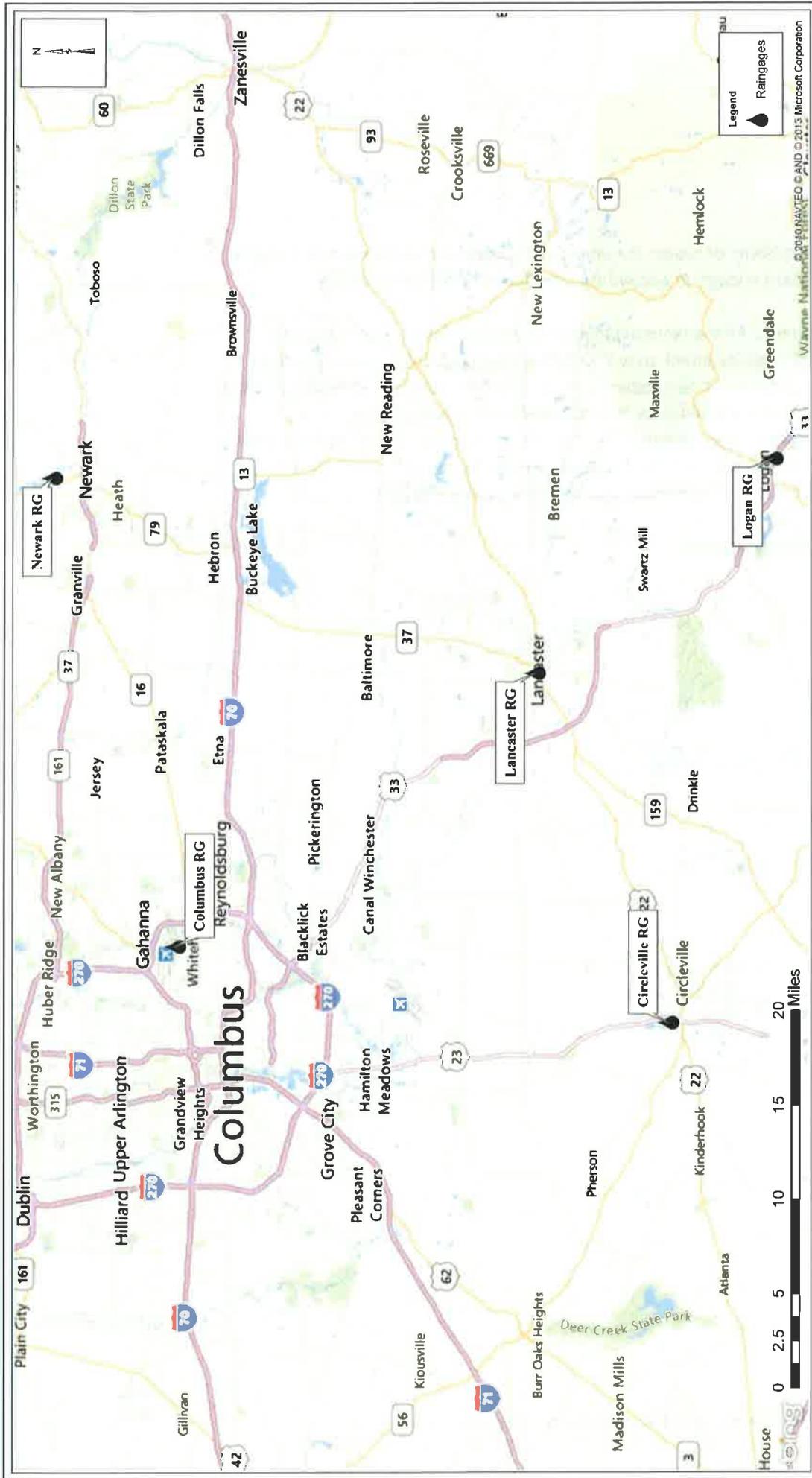


Thomas J. Bulcher, PE

Associate Vice President

Copies:

Mr. Mike Nixon, City of Lancaster  
Ms. Denise Crews, City of Lancaster  
Mr. Matt Boone, ARCADIS  
Ms. Laura McGinnis, ARCADIS



City of Lancaster

### Development of a Typical Year

Figure 1 : Locations of NOAA Historical Rain Gauges



MALCOLM  
PIRNIE

The Water Division of ARCADIS

**Table 1**  
**NOAA NCDC - Circleville Rain Gauge**  
**Historical Rainfall Data - Monthly Rainfall Totals**

STATION	Year	January (in.)	February (in.)	March (in.)	April (in.)	May (in.)	June (in.)	July (in.)	August (in.)	September (in.)	October (in.)	November (in.)	December (in.)	Total (in.)
331592	1966	3.6	2.8	1.1	4.3	2.1	1.0	5.7	2.5	3.9	0.9	5.4	3.3	36.4
331592	1967	0.9	1.6	4.9	4.0	6.4	2.0	2.2	1.7	4.4	2.0	3.0	2.2	35.2
331592	1968	2.3	0.5	4.7	2.3	12.4	3.5	1.3	7.6	2.0	2.4	3.7	3.3	46.0
331592	1969	3.2	1.1	1.3	3.4	1.8	4.5	4.2	4.4	0.5	1.8	2.8	2.6	31.6
331592	1970	1.2	2.0	3.1	6.3	3.8	6.6	4.3	2.6	6.2	2.2	3.2	3.0	44.5
331592	1971	1.8	3.6	2.2	0.6	4.3	4.4	2.6	3.3	2.3	1.4	2.3	3.2	32.0
331592	1972	1.6	1.6	2.4	4.1	5.7	3.6	1.7	3.8	5.6	2.1	5.1	3.7	41.0
331592	1973	2.0	1.4	3.2	4.9	4.2	4.4	7.5	4.2	2.2	3.1	4.9	2.9	44.9
331592	1974	2.6	2.0	2.0	3.5	5.5	4.7	1.5	5.2	3.6	1.5	2.7	2.6	37.4
331592	1975	2.6	4.0	5.0	3.0	4.4	4.7	2.9	5.1	5.7	3.0	1.4	3.1	44.9
331592	1976	2.5	2.6	1.8	1.7	1.4	5.4	5.8	5.6	2.5	2.2	0.5	0.8	32.8
331592	1977	1.2	0.5	3.9	3.2	2.6	2.4	6.0	4.8	2.7	3.6	2.6	3.1	36.6
331592	1978	4.7	0.4	3.1	3.2	4.2	3.4	2.1	4.2	1.8	3.7	1.9	5.4	38.1
331592	1979	3.2	3.1	0.9	4.0	3.7	5.8	5.0	6.9	7.4	1.3	3.4	1.7	46.4
331592	1980	1.8	1.1	3.8	2.6	4.1	4.0	6.9	9.0	1.6	1.6	2.2	1.5	40.2
331592	1981	0.2	3.6	1.9	4.7	7.0	5.7	2.1	0.6	2.0	1.6	2.3	2.1	33.8
331592	1982	4.7	1.6	4.6	1.5	4.1	3.7	0.7	2.2	1.2	0.5	4.5	4.3	33.6
331592	1983	1.3	0.7	0.9	5.1	5.7	2.8	3.7	3.0	1.5	5.3	4.7		34.7
331592	1984		1.9					1.7	3.3	2.0	3.8	3.9	3.2	19.8
331592	1985	1.2	1.3		1.3	5.1	1.6	3.8	2.7	0.8	3.2	10.3	2.0	33.3
331592	1986	1.3	3.2	2.3	2.1	2.0	2.0	3.3	3.0		0.7	3.4	2.6	25.9
331592	1987	1.0	1.0	1.8	1.4	2.7		0.5	1.6	1.5	1.1	1.2	3.2	17.0
331592	1988	2.1	4.3	2.9	3.0	1.5	0.7	5.2	2.5	4.7	2.5	4.0	2.4	35.8
331592	1989			1.4	5.8	8.5	0.7	8.1	2.1	3.2	3.3		1.6	34.7
331592	1990			0.7	3.4	10.7	2.9	6.2	3.1	3.1	4.9	1.8	8.4	45.2
331592	1991	2.4	3.0	5.3	4.0	0.5	0.9	1.5	2.1	4.1	1.3	0.7	3.6	29.4
331592	1992	1.4	1.1	3.3	1.9	3.0	2.7	7.7	5.9	1.3	0.6	4.1	1.4	34.4
331592	1993	3.3	2.4	2.9	4.4	2.2	4.1	5.0		2.0	0.1	10.2		36.6
331592	1994	4.4	1.1	3.8	5.3	2.1	2.3	3.9	2.7	2.9		2.8	3.1	34.4
331592	1995	4.3	1.2	1.2	2.4	7.0	2.7	1.2	2.9	1.0	3.7	2.0	2.6	32.2
331592	1996		2.1	2.9	5.2	7.6	7.8	2.2	1.5	5.4	1.2	3.7	2.8	42.4
331592	1997	2.2	1.8	5.6	0.8	4.9	1.6	3.8	9.1	1.1	2.6	2.9	1.6	38.0
331592	1998	2.8	2.5	2.4	7.2	3.8	9.3	2.2	1.1	1.4	4.0	1.8	2.0	40.5
331592	1999	3.2	3.1	1.8	2.0		0.1	1.9	2.5	1.1	1.7	1.6	2.5	21.5
331592	2000	3.7	4.0	2.5	3.1	1.7	3.9	2.7	3.8	3.2	2.4	1.9	3.9	36.8
331592	2001	1.1	0.5	2.1	4.8	6.1	2.0	4.1	1.4	1.1	4.3	2.7	2.3	32.5
331592	2002	1.7	0.3	3.0	3.6	4.4	2.8	2.7	0.4	2.4		2.6	2.7	26.6
331592	2003	1.0	2.5	1.5	2.8	5.1	2.4	3.9	4.1		1.4	3.1	2.2	30.0
331592	2004	4.3	0.6			6.3	3.8	6.2	1.8	4.7		3.9	2.5	34.1
331592	2005				2.3	1.8	0.4	2.4	4.7	1.2	2.2	4.5	1.7	21.2
331592	2006	3.3				2.2	3.7	2.9	3.6	7.0	5.4			28.1
331592	2007													0.0
331592	2008													0.0
331592	2009													0.0
331592	2010													0.0
331592	2011													0.0
331592	2012													0.0
	Ave.	2.4	1.9	2.7	3.4	4.4	3.4	3.6	3.6	2.9	2.4	3.3	2.8	36.9

**Table 2**  
**NOAA NCDC - Logan Rain Gauge**  
**Historical Rainfall Data - Monthly Rainfall Totals**

STATION	Year	January (in.)	February (in.)	March (in.)	April (in.)	May (in.)	June (in.)	July (in.)	August (in.)	September (in.)	October (in.)	November (in.)	December (in.)	Total (in.)
334672	1966	2.0		1.5	4.4	1.5	0.3	2.1	2.3	4.8	0.9	5.2	2.4	27.4
334672	1967	0.7	2.5	5.0	3.2	2.3	0.7	3.2	1.2	2.4	1.7	3.0	2.4	28.4
334672	1968	2.6	0.7	4.1	2.0	10.7	3.1	2.7	2.9	2.1	2.2	3.1	3.6	39.7
334672	1969	2.4	0.8	1.8	4.8	2.5	5.0	5.2	4.0	1.3	1.8	2.7	2.5	34.7
334672	1970	0.5	1.9	2.5	5.7	2.0	3.7	5.4	5.5	4.9	2.9	1.9	3.2	40.0
334672	1971	2.1	4.0	2.1	0.6	4.0	5.5	2.1	2.4	1.7	1.0	1.9	2.7	30.2
334672	1972	2.3	2.6	3.2	5.3	3.3	2.9	1.9	3.8	5.1	2.0	5.0		37.6
334672	1973			2.8	6.7	3.4	3.6	3.5	1.7	1.5	3.1	2.8	1.4	30.3
334672	1974	3.3	1.6	2.8	3.1	5.4	6.3	1.8	8.5	6.4	1.0	3.0	2.5	45.6
334672	1975	3.1	2.3	3.1	3.0	3.5	3.3	3.6	8.8	6.8	3.3	1.7	3.6	46.0
334672	1976	3.1	2.1	2.9	1.4	1.9	5.8	7.8	3.0	2.7	2.7	0.7	1.2	35.3
334672	1977	1.9	1.0	4.1	3.7	3.6	3.6	3.4	2.6	1.9	2.7	2.3	2.8	33.3
334672	1978	4.3	0.2	2.4	1.7	4.8	3.4	2.9	4.2	0.9	6.0	1.9	5.2	37.8
334672	1979	3.8	3.7	2.5	1.5	6.0	3.9	3.8	7.0	5.8	1.7	2.8		42.6
334672	1980	1.1	0.1	2.8	2.0		1.9	1.5	3.2			1.0		13.5
334672	1981		4.2	0.6			13.7	0.5	1.8	1.0		2.3	1.5	25.7
334672	1982	0.9	2.9	5.8	0.6	6.2			2.9		1.2			20.3
334672	1983					3.4	1.3	2.3	0.6	0.8	6.7	3.2	3.0	21.1
334672	1984	0.1	1.6		2.7	5.3	0.3	1.6	1.3	0.4		2.4		15.6
334672	1985		1.8	3.2	0.3		0.8	5.3	1.7			2.1	0.4	15.5
334672	1986			1.9		2.5	4.2	3.3	2.4	3.8	2.0			20.1
334672	1987		0.8	1.7	0.1		7.2	2.9			0.8	1.5	3.5	18.5
334672	1988	1.5	3.6	3.7	2.7	2.0	1.1	3.3	4.4	2.3	2.0	4.3	2.1	33.0
334672	1989	2.9	4.5	4.8	4.2	6.2	4.8	3.5	3.9	3.0	2.5	2.0	2.2	44.5
334672	1990	2.7	2.7	1.8	2.6	12.1	2.2				3.9	1.8	6.6	36.4
334672	1991	0.7						3.1	3.3	1.4	0.9	1.4	3.8	14.6
334672	1992	1.2	1.4	3.6	1.9	3.4	2.1	9.1	1.6	1.9	0.6	0.7		27.5
334672	1993		2.4	0.7		1.5	4.6	2.8						12.0
334672	1994			3.3					3.1	1.5	0.3	1.6		9.8
334672	1995			1.7	1.6	4.1	1.2	1.3	2.9	0.6		1.2	2.7	17.3
334672	1996		2.3		3.6		3.3	1.2	0.6	1.0	1.4	4.0	3.2	20.6
334672	1997	2.2	1.6		7.6	4.0	4.0	4.2	9.6	0.6	1.4	2.7	1.7	39.6
334672	1998	5.5	3.1	2.7	6.9	3.2	5.9	2.1	1.6	2.3	3.6	0.3		37.2
334672	1999			1.4	1.1	2.1	0.7	1.1	4.1	1.5	2.1			14.1
334672	2000				1.8	3.3	4.9	3.7		3.5	0.7			17.9
334672	2001	1.3	1.1	3.2	4.4	5.4	1.9	5.1	1.6					24.0
334672	2002		0.3	4.1	2.5	4.0		4.3	0.4	3.7	4.6	2.0	3.2	29.1
334672	2003	1.1	3.0	1.2										5.3
334672	2004													0.0
334672	2005													0.0
334672	2006													0.0
334672	2007													0.0
334672	2008													0.0
334672	2009													0.0
334672	2010									1.7	2.2	5.6		9.5
334672	2011	1.3	5.3	0.3	8.3	5.1	3.5	5.8		3.0	4.4	7.2	3.4	47.6
334672	2012													0.0
	Ave.	2.1	2.2	2.7	3.2	4.2	3.5	3.4	3.3	2.6	2.3	2.6	2.8	34.8

**Table 3**  
**NOAA NCDC - Newark Rain Gauge**  
**Historical Rainfall Data - Monthly Rainfall Totals**

STATION	Year	January (in.)	February (in.)	March (in.)	April (in.)	May (in.)	June (in.)	July (in.)	August (in.)	September (in.)	October (in.)	November (in.)	December (in.)	Total (in.)
335747	1966	2.8	2.8	1.4	6.1	3.4	1.8	6.8	4.0	3.0	1.0	4.2	3.4	40.7
335747	1967	0.1	2.3	5.2		4.9	1.6	4.1	2.6	3.4	1.9	3.3	2.9	32.3
335747	1968	2.6	0.6	3.9	2.5	8.1	3.7	2.6	3.1	3.1	2.3	3.7	1.0	37.2
335747	1969	4.4	1.0	1.7	2.5	2.1	7.1	5.3	2.5	1.6	2.2	3.6	1.9	35.9
335747	1970	1.5	2.0	3.2	7.2	5.7	5.8	3.6	2.3	6.3	3.0	3.0	0.3	43.9
335747	1971	1.9		1.2	0.9	5.1	4.5	4.7	2.2	2.3	1.1	2.1	5.6	31.6
335747	1972	1.4	1.7	3.4	5.9	5.3	1.4	3.1	5.3	4.0	2.1	5.1	3.2	41.9
335747	1973	2.6		3.9	4.5	3.2	3.6	4.2	2.1	0.7	3.2			28.0
335747	1974				3.6	5.1	3.4		6.5		1.2	3.8	2.8	26.4
335747	1975	3.7	4.2	4.5	3.1	3.3	3.0	2.6	5.8	4.7	3.4	2.2	3.4	43.9
335747	1976	3.6	2.8	3.2	1.2	1.9	6.1	5.4	5.1	2.9	3.5	1.0	1.0	37.7
335747	1977	1.5	1.0	4.7	4.7	2.0	4.0	5.7	4.8	4.3	3.3	3.8	4.1	43.9
335747	1978	5.5	0.2	3.5	4.3	4.0	5.6	1.7	10.8	1.8	3.2	2.0	5.2	47.8
335747	1979	2.3	3.5	1.8	5.1	5.8	4.8	9.3	8.7	8.7	1.4	3.1	2.1	56.6
335747	1980	2.1	1.2	6.4	2.7		3.8	5.0	8.8	1.2	3.0	2.8	2.1	39.1
335747	1981	0.5	4.7	1.7	7.4	6.1	8.4	5.8	2.4	2.5	1.8	2.2	3.0	46.5
335747	1982	5.5	2.4	4.3	2.5	4.3	3.4		2.3	2.0	1.1	5.0	4.5	37.3
335747	1983	1.7	1.3	1.5	6.2	6.6	5.4	2.7	1.3	2.5	5.5	5.2	3.8	43.7
335747	1984	1.2	2.8	5.0	4.2	5.6	2.0	2.1	3.5	1.0	3.3	3.5		34.2
335747	1985	1.2	2.4	4.3	1.1	5.4	2.4	5.9	1.6	1.2	1.5	13.3	1.6	41.9
335747	1986	2.3	3.7	2.5	1.8	1.4	4.4	4.7	1.0	4.7	6.1	3.0	3.6	39.2
335747	1987	0.3	1.6	1.9	3.3	3.7	4.8	0.7	4.2	0.7	1.6	1.5	3.0	27.3
335747	1988	2.0	4.4	2.8	1.8	2.3	1.8	6.7	3.7	5.0	1.7	4.4	2.7	39.3
335747	1989	3.4	2.8	4.4	4.3	6.2	5.4	2.7	4.4	3.4	3.0	3.0	1.9	44.9
335747	1990	2.9	4.7	1.1	3.2		14.0	8.8	1.7	4.0	3.7	1.7	2.7	48.5
335747	1991	5.7	2.2		7.9	0.9	0.7	0.6	2.5	2.2	1.0	1.6	3.6	28.9
335747	1992	1.9	0.8	4.1	2.8	2.4	1.8	9.9	4.6	2.0	1.3	4.3	1.3	37.2
335747	1993	3.3	2.3	4.9	3.6	1.9	4.7	6.6	1.7	3.1	3.1	4.6	2.5	42.3
335747	1994	4.1	2.0	3.1	4.8	1.4	4.9	2.9	5.5	2.0	1.1	3.3	2.4	37.5
335747	1995	4.1	1.4	1.3	2.5	4.6	3.0	2.2	6.2	0.7	4.5	2.3	2.1	34.9
335747	1996	3.8	3.2	3.0	5.4	5.3	3.6	0.8	0.6	4.8	1.5		2.8	34.8
335747	1997				1.7	6.2	0.3	1.4	8.0			1.4		19.0
335747	1998	5.2		5.0	6.2		12.6	0.8	4.0	1.6	4.2	1.9	4.3	45.8
335747	1999	3.9	0.9	2.0	6.4	1.5	0.6	3.1	4.7	2.1	1.9	2.3	2.9	32.3
335747	2000	3.3	3.5	3.6	3.5	3.7	1.9	3.9	4.6	3.9	4.0	1.6	4.9	42.4
335747	2001	3.0	1.6	1.3	3.3	5.6	1.6	4.4	4.1	1.5	4.7	4.0	3.2	38.3
335747	2002	2.1	1.4	3.5	3.4		7.1	3.6	1.7	3.9	3.3	2.5	3.0	35.5
335747	2003	1.9	3.7	2.2	3.6	7.5	3.9	3.7	6.3	6.7	2.1	3.4	3.0	48.0
335747	2004	5.5	2.4		4.5	0.8	5.4	4.3	4.6	3.8	3.6	4.8	3.2	42.9
335747	2005	9.7	2.4	2.5	3.8	4.8	4.1	1.6	8.8	3.3	2.7	4.0	1.4	49.1
335747	2006	3.1	1.7	4.2	0.2	2.4	4.2	5.6	2.7	6.2	5.4			35.7
335747	2007	4.8	2.2	3.4	2.6	1.1	0.5							14.6
335747	2008													0.0
335747	2009													0.0
335747	2010													0.0
335747	2011													0.0
335747	2012													0.0
	Ave.	3.1	2.3	3.2	3.8	4.0	4.1	4.1	4.2	3.1	2.7	3.4	2.9	40.9

**Table 4**  
**NOAA NCDC - Port Columbus International Airport Rain Gauge**  
**Historical Rainfall Data - Monthly Rainfall Totals**

STATION	Year	January (in.)	February (in.)	March (in.)	April (in.)	May (in.)	June (in.)	July (in.)	August (in.)	September (in.)	October (in.)	November (in.)	December (in.)	Total (in.)
331786	1966	2.9	2.6	1.0	4.9	3.1	1.3	5.9	4.9	3.5	0.8	4.1	3.3	38.4
331786	1967	0.8	2.5	4.4	3.3	4.6	2.9	4.2	1.5	2.6	1.4	3.2	2.6	34.0
331786	1968	2.2	0.4	3.0	2.2	9.1	3.0	2.7	3.2	1.8	2.6	4.3	3.4	37.8
331786	1969	3.4	1.2	1.3	3.1	3.0	8.2	7.7	3.3	1.4	1.5	3.9	2.3	40.2
331786	1970	1.6	1.7	3.0	5.5	5.4	5.7	3.7	3.9	4.0	2.1	2.9	2.5	41.9
331786	1971	1.6	3.2	2.7	0.7	3.7	4.2	4.2	2.8	3.1	1.3	1.7	4.6	33.7
331786	1972	1.4	1.7	2.9	3.7	6.6	4.0	2.6	8.0	5.1	1.7	4.4	3.5	45.6
331786	1973	2.5	1.3	3.4	3.7	3.4	8.8	4.1	5.0	2.8	3.3	5.4	2.7	46.2
331786	1974	2.4	2.3	4.4	2.7	3.3	5.0	1.1	4.9	3.3	1.5	3.2	2.8	37.0
331786	1975	3.2	3.5	4.1	2.7	3.2	3.5	2.0	4.5	5.5	2.3	1.5	3.0	39.0
331786	1976	3.2	2.0	2.2	1.4	1.4	4.5	5.1	5.1	2.5	2.9	0.6	0.9	31.9
331786	1977	1.6	1.0	3.9	4.0	1.0	3.9	2.7	4.8	3.5	2.6	3.8	3.5	36.1
331786	1978	5.9	0.3	3.0	3.0	4.2	3.7	1.8	5.2	1.2	2.4	1.6	5.0	37.1
331786	1979	3.3	2.9	1.0	4.0	3.3	4.2	8.1	8.6	6.8	1.3	3.9	1.8	49.2
331786	1980	1.7	1.4	3.8	1.6	4.6	5.2	4.6	6.3	1.9	2.5	2.1	2.0	37.4
331786	1981	0.7	4.6	1.1	5.4	6.5	5.7	4.1	1.4	2.3	1.4	1.7	2.9	37.8
331786	1982	4.8	1.5	4.0	1.9	4.7	3.4	3.9	1.0	4.3	0.9	5.2	3.8	39.4
331786	1983	1.2	0.7	1.7	5.5	5.1	4.6	2.8	2.2	1.9	4.5	5.0	3.2	38.4
331786	1984	1.1	2.0	3.9	3.1	4.9	0.7	3.2	3.0	1.5	2.9	4.4	2.8	33.4
331786	1985	1.3	1.7	3.8	0.7	5.0	1.4	6.9	2.3	1.2	1.9	10.7	1.8	38.7
331786	1986	1.5	3.0	2.6	1.3	2.5	5.5	3.6	1.6	3.4	4.2	3.0	2.8	35.0
331786	1987	1.1	0.6	2.0	2.0	2.9	3.6	3.9	3.0	1.5	1.6	1.6	2.9	26.7
331786	1988	2.1	4.3	2.5	2.2	2.3	1.3	7.8	2.7	3.5	1.7	3.6	2.5	36.6
331786	1989	2.0	3.1	4.2	3.3	4.7	6.4	6.8	4.3	2.2	2.5	2.7	1.8	43.8
331786	1990	2.4	5.2	1.3	2.8	7.0	5.3	8.0	1.9	5.3	5.1	2.0	7.0	53.2
331786	1991	2.0	2.3	4.0	4.2	2.5	2.8	2.1	2.0	4.1	1.8	1.3	3.8	32.7
331786	1992	1.8	0.9	3.4	2.8	3.4	2.3	12.4	3.8	2.1	1.4	4.0	1.3	39.6
331786	1993	4.1	1.8	3.5	4.5	2.5	3.3	6.0	0.7	1.8	3.1	4.5	2.2	37.9
331786	1994	3.8	1.6	1.9	3.6	1.6	2.0	6.0	3.3	1.7	0.9	2.9	2.2	31.6
331786	1995	4.5	1.6	1.6	3.2	4.9	5.3	7.0	7.6	1.2	4.0	2.5	2.0	45.3
331786	1996	3.7	2.2	2.8	6.1	5.2	3.4	3.8	1.5	5.3	1.3	2.9	3.3	41.5
331786	1997	2.2	1.5	4.0	1.4	5.5	6.0	2.7	5.8	1.4	0.8	2.9	2.1	36.1
331786	1998	2.3	2.2	1.9	6.3	3.1	6.0	2.8	2.0	1.2	3.1	2.0	3.3	36.1
331786	1999	2.9	2.7	1.9	3.6	1.8	0.7	3.0	2.4	1.9	1.0	1.9	2.7	26.5
331786	2000	3.5	2.7	2.7	4.2	4.9	3.5	4.1	4.1	4.2	2.7	2.1	3.5	42.2
331786	2001	1.2	1.4	1.0	3.4	7.0	2.3	4.7	4.1	1.6	3.3	3.7	3.0	36.6
331786	2002	1.8	1.7	3.4	4.0	6.6	2.3	4.1	2.1	4.4	2.7	2.8	2.8	38.7
331786	2003	1.2	2.1	2.2	2.5	5.9	5.0	2.9	11.4	6.9	1.8	2.9	2.7	47.5
331786	2004	4.8	2.0	3.1	3.9	5.9	5.3	6.5	3.3	3.0	3.3	4.1	3.3	48.4
331786	2005	8.5	1.2	3.1	4.4	3.4	2.6	1.9	5.1	2.9	1.3	3.1	1.7	39.1
331786	2006	2.7	1.4	3.4	2.5	3.3	4.3	5.8	2.9	5.4	6.7	2.1	3.2	43.6
331786	2007	4.3	2.1	6.7	2.3	1.4	2.8	3.0	4.7	2.5	3.6	2.2	4.4	39.9
331786	2008	1.6	3.9	7.0	2.2	3.1	10.4	1.7	3.7	2.5	1.4	2.5	4.9	44.8
331786	2009	2.7	1.9	1.2	4.2	2.5	3.4	4.9	3.3	2.5	4.9	0.4	3.6	35.4
331786	2010	2.4	2.2	2.8	2.5	3.9	5.4	6.0	2.2	1.7	1.5	4.3	1.3	36.1
331786	2011	1.4	4.3	4.6	7.1	5.9	3.0	5.7	2.5	6.6	3.7	4.8	5.4	54.9
331786	2012	3.7	1.9	4.9	3.5	2.3	2.1	2.5						20.9
	Ave.	2.6	2.1	3.0	3.3	4.1	4.0	4.5	3.8	3.1	2.4	3.2	3.0	39.1

**Table 6**  
**NOAA NCDC - Lancaster Rain Gauge with Columbus Rain Gauge Substitutions**  
**Historical Rainfall Data - Monthly Rainfall Totals**

STATION	Year	January (in.)	February (in.)	March (in.)	April (in.)	May (in.)	June (in.)	July (in.)	August (in.)	September (in.)	October (in.)	November (in.)	December (in.)	Total (in.)
334403	1966	3.9	3.0	0.8	4.2	2.3	0.9	6.8	1.6	3.5	0.6	4.2	2.8	34.4
334403	1967	0.8	1.6	6.1	2.8	5.2	2.2	3.6	2.2	4.1	1.1	3.2	3.0	35.8
334403	1968	2.4	0.4	4.3	2.4	10.9	3.5	2.1	2.8	1.8	1.0	3.2	3.4	38.2
334403	1969	3.0	1.3	1.5	3.0	1.6	4.4	2.1	2.4	0.4	2.1	2.9	2.6	27.4
334403	1970	1.3	1.8	3.1	6.6	3.5	3.7	2.5	4.0	4.7	2.5	2.5	2.9	39.0
334403	1971	1.7	4.4	2.7	0.7	3.4	3.4	2.3	3.7	2.0	1.1	1.7	3.3	30.4
334403	1972	1.8	1.7	3.1	6.0	3.6	4.0	2.2	3.7	3.4	2.9	5.3	3.5	41.2
334403	1973	2.4	1.3	3.0	5.5	3.8	6.9	4.1	8.9	2.1	4.8	4.1	2.7	49.6
334403	1974	2.4	2.3	2.5	3.5	5.3	4.5	2.1	6.1	3.5	0.9	2.8	3.2	39.1
334403	1975	2.5	4.5	4.1	3.0	2.7	3.5	3.3	5.4	6.0	4.2	1.7	3.3	44.2
334403	1976	2.4	3.0	2.2	1.2	2.5	4.8	7.2	4.7	1.6	3.0	0.2	0.9	33.7
334403	1977	1.1	0.4	3.5	2.9	2.1	4.0	2.6	3.7	3.0	4.0	3.8	3.0	34.1
334403	1978	5.2	0.6	3.1	3.8	5.5	2.9	2.6	5.4	1.0	4.6	1.9	5.5	42.1
334403	1979	3.6	4.1	1.1	3.8	4.3	1.8	5.3	9.5	6.6	1.4	2.8	1.7	46.0
334403	1980	1.8	1.5	4.1	2.4	4.1	4.2	8.9	8.4	2.0	1.6	2.2	1.6	42.8
334403	1981	0.7	4.0	2.0	5.0	6.5	9.0	1.8	0.9	2.0	1.3	2.6	2.4	38.2
334403	1982	4.6	1.6	4.3	1.6	3.0	2.5	1.2	1.0	4.3	1.4	5.2	3.8	34.5
334403	1983	1.2	1.4	1.0	5.5	7.1	4.2	4.1	1.3	2.0	5.0	4.1	3.3	40.2
334403	1984	1.1	2.6	0.7	2.8	4.5	1.1	1.9	0.2	3.0	2.9	3.3	3.2	27.3
334403	1985	0.8	2.3	5.5	0.7	2.3	1.9	8.3	2.3	0.8	2.3	9.9	1.8	39.0
334403	1986	1.5	3.0	2.6	1.4	2.0	3.8	3.4	1.8	0.9	5.3	1.4	3.3	30.4
334403	1987	0.2	0.9	1.5	3.8	1.5	2.1	2.3	1.3	1.8	1.6	1.2	1.7	19.9
334403	1988	3.6	4.1	2.5	0.9	1.8	1.2	7.8	2.7	3.5	0.7	3.6	2.2	34.6
334403	1989	2.1	3.9	5.3	5.7	7.1	5.5	4.5	6.0	3.1	2.8	1.6	2.2	49.8
334403	1990	2.2	3.1	1.3	2.8	8.7	4.3	6.3	3.0	2.9	3.6	1.5	6.9	46.6
334403	1991	2.0	2.3	4.9	4.3	0.7	1.9	4.0	2.0	1.5	1.0	0.8	3.3	28.7
334403	1992	0.9	0.7	2.7	2.8	3.5	2.1	12.4	3.8	1.7	0.3	1.9	1.3	34.1
334403	1993	4.1	1.8	2.3	4.5	2.5	0.5	4.5	0.5	3.0	2.4	4.1	0.9	31.1
334403	1994	3.5	1.9	2.7	3.4	2.6	5.5	5.3	2.1	2.0	0.7	2.4	2.1	34.2
334403	1995	4.2	2.0	1.0	1.4	8.3	4.3	3.6	3.2	0.9	3.0	1.8	2.9	36.6
334403	1996	4.3	1.5	2.8	3.6	7.3	4.5	5.5	0.7	3.1	1.6	3.4	2.3	40.6
334403	1997	1.7	1.0	4.3	1.4	2.2	2.4	5.3	6.8	2.1	2.1	3.3	2.0	34.6
334403	1998	3.0	2.9	2.1	6.3	1.8	6.4	1.7	2.3	2.9	5.4	1.9	2.0	38.7
334403	1999	4.8	3.2	2.2	3.3	2.1	0.2	2.1	3.7	3.1	1.6	1.0	2.2	29.5
334403	2000	3.7	3.7	3.0	1.4	3.0	2.8	2.1	2.3	2.6	0.8	0.9	4.1	30.4
334403	2001	1.4	0.7	1.8	4.3	4.2	1.4	3.5	4.8	1.4	4.2	3.1	2.0	32.8
334403	2002	2.2	1.2	3.1	4.0	2.6	3.2	2.3	2.3	4.4	4.6	2.3	2.8	34.9
334403	2003	0.1	3.1	2.1	1.9	4.8	2.6	4.5	1.5	5.3	1.6	0.3	2.9	30.7
334403	2004	4.8	2.0	3.1	3.4	1.3	5.0	7.6	3.3	1.9	3.8	4.2	3.7	44.0
334403	2005	8.0	1.1	3.2	4.1	2.6	0.5	1.4	6.2	3.0	3.9	3.6	1.6	39.2
334403	2006	3.0	1.1	2.6	3.0	3.1	6.2	4.8	3.8	5.9	1.8	2.1	3.2	40.6
334403	2007	4.1	2.1	4.7	2.8	0.9	3.1	6.1	4.7	2.5	3.6	2.2	4.4	41.2
334403	2008	1.6	3.9	7.0	2.0	5.5	5.2	1.7	2.6	0.9	1.2	2.5	4.9	38.8
334403	2009	2.7	1.9	1.2	4.2	2.6	2.8	4.9	3.3	2.5	4.9	0.4	3.6	34.9
334403	2010	2.4	2.2	2.8	1.8	5.4	5.6	3.9	5.7	1.1	1.6	4.7	1.3	38.4
334403	2011	1.6	4.7	4.5	1.5	6.3	4.8	7.2	3.1	3.6	3.9	5.2	4.2	50.6
334403	2012	3.8	1.4	4.9	3.5	2.3	2.1	2.5						20.6
	Ave.	2.6	2.2	3.0	3.2	3.8	3.5	4.2	3.5	2.7	2.5	2.8	2.9	37.0

