

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

HYDROLOGIC DATA FOR URBAN STORM RUNOFF FROM THREE LOCALITIES
IN THE DENVER METROPOLITAN AREA, COLORADO

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Denver Board of Water Commissioners, the
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Lakewood, Colorado

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GLOSSARY

- catchment area*.--An area surrounded by a continuous ridge within which all runoff is expected to join into a single flow stream, and which extends to the point of junction of this flow stream (downstream) with the ridge. Natural boundaries, manmade boundaries, or minimum size of pipe are criteria which can be used to define the catchment (Alley, 1976).
- constituent load*.--The total amount of a selected constituent in a storm runoff, or a specified period of time, discharged into a receiving water.
- impervious areas*.--Areas which do not permit percolation of water, such as streets, sidewalks, roofs, and paved parking lots.
- impervious areas, effective*.--Impervious areas which are connected and, in turn, connect to some means of conveying the runoff out of the areas, such as roofs which drain onto driveways, streets, sidewalks, and paved parking lots.
- impervious areas, noneffective*.--Impervious areas which are not connected to other impervious areas and which drain to pervious areas, such as roofs which drain onto lawns.
- land use*.--A term which relates to both the physical characteristics of the land surface and the human activities associated with the land surface (Alley, 1976).
- model calibration*.--The process of fitting a model to a set of observed data. This is done by changing unknown or uncertain model parameters systematically within their allowable ranges until a "best" fit of the model to the observed data is achieved (Alley, 1976).
- pervious areas*.--Areas that allow percolation of water, such as lawns and fields of porous material.
- receiving water*.--"Natural" body of water that runoff from one or more catchments enters; this includes a tributary, river, estuary, bay, lake, or other body of water.

METRIC CONVERSION FACTORS

<i>Multiply</i>	<i>By</i>	<i>To obtain</i>
inch	25.40	millimeter
foot (ft)	.3048	meter
acre	.4047	hectare
square mile	2.590	square kilometer
cubic foot per second (CFS or ft ³ /s)	.02832	cubic meter per second
ton per acre-foot (ton per ac-ft)	1.119×10 ⁻³	metric ton per cubic hectometer
ton per day	.9072	metric ton per day
		microgram per liter (UG/L)
		milligram per liter (MG/L)
		milliliter (ML)

HYDROLOGIC DATA FOR URBAN STORM RUNOFF FROM THREE LOCALITIES IN THE DENVER METROPOLITAN AREA, COLORADO

By Sherman R. Ellis

ABSTRACT

Urban storm-runoff data, collected from 1975 to 1977, on three catchment areas in the Denver metropolitan area are presented in this report. The catchments are predominantly a single-family residential catchment area in Littleton, a multifamily residential and commercial catchment area in Lakewood, and a high-density residential and commercial catchment area in Denver. Precipitation, rainfall-runoff, snowmelt-runoff, water-quality (common constituents, nutrients, biochemical oxygen demand, coliform bacteria, and solids, trace elements, and pesticides), and catchment-area data are necessary to use the U.S. Environmental Protection Agency's Storm Water Management Model II. The urban storm-runoff data may be used by planning, water-management, and environmental-protection agencies to assess the impact of urban storm runoff on the hydrologic system.

INTRODUCTION

Colorado and, in particular, the Denver metropolitan area are experiencing an increase in population and industry that is having a profound effect on water quality and on the usefulness of streams draining the area. Water-quality problems can be unusually severe in urban areas as a result of dense population and numerous industrial operations. The quality of the urban storm runoff flowing into the receiving waters is a factor that needs to be considered in waste-treatment-management systems because of the potential for pollution by the runoff.

Public Law 92-500, the Federal Water Pollution Control Act, (amendment of 1972) Section 208, requires the development and implementation of a plan for a coordinated waste-treatment-management system. State, county, and local agencies have directed attention to the identification of major sources of water pollution--untreated or inadequately treated domestic and industrial waste. Ultimately, though, attention needs to be directed toward identification and description of less obvious water-pollution sources. Storm-water runoff is one such source of water-quality degradation. A hydrologic-data base is necessary to permit determination of the magnitude and type of pollution caused by storm-water runoff.

During 1975, the U.S. Geological Survey entered into separate, but coordinated, cooperative agreements with the Denver Board of Water Commissioners, the Denver Regional Council of Governments, and the Urban Drainage and Flood Control District to investigate the quantity and quality of urban storm runoff originating from three catchment areas in the Denver metropolitan area. The catchment areas selected were a single-family residential catchment area in Littleton where storm runoff flows out of the catchment area in a tributary to Big Dry Creek, a multifamily residential and commercial catchment area in Lakewood where storm runoff flows out of the catchment area through a storm drain at North Avenue on the Denver Federal Center, and a high-density residential and commercial catchment area in Denver where storm runoff flows out of the catchment area through a storm sewer at Thirty-sixth Street. Monitoring sites were established by the U.S. Geological Survey at the points where the storm runoff leaves each catchment area. The identification of the monitoring sites used in this report are: 06710200 Big Dry Creek tributary at Littleton; 06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood; and 06714100 Thirty-sixth Street Storm Sewer at Denver. The locations of the monitoring sites are shown on figure 1 and general information about the sites is summarized in table 1.

Table 1.--*Selected data for monitoring sites
and their catchment areas*

U.S. Geological Survey downstream order number	Name of monitoring site	Latitude- longitude of monitoring site	Drainage area, in acres	Percentage of area covered by effective impervious surfaces
06710200	Big Dry Creek tributary at Littleton-----	39°35'46", 104°57'06"	606	15
06711635	North Avenue Storm Drain at Denver Federal Cen- ter, at Lakewood-----	39°43'21", 105°07'47"	76.7	30
06714100	Thirty-sixth Street Storm Sewer at Denver-	39°46'23", 104°58'46"	2,246	40

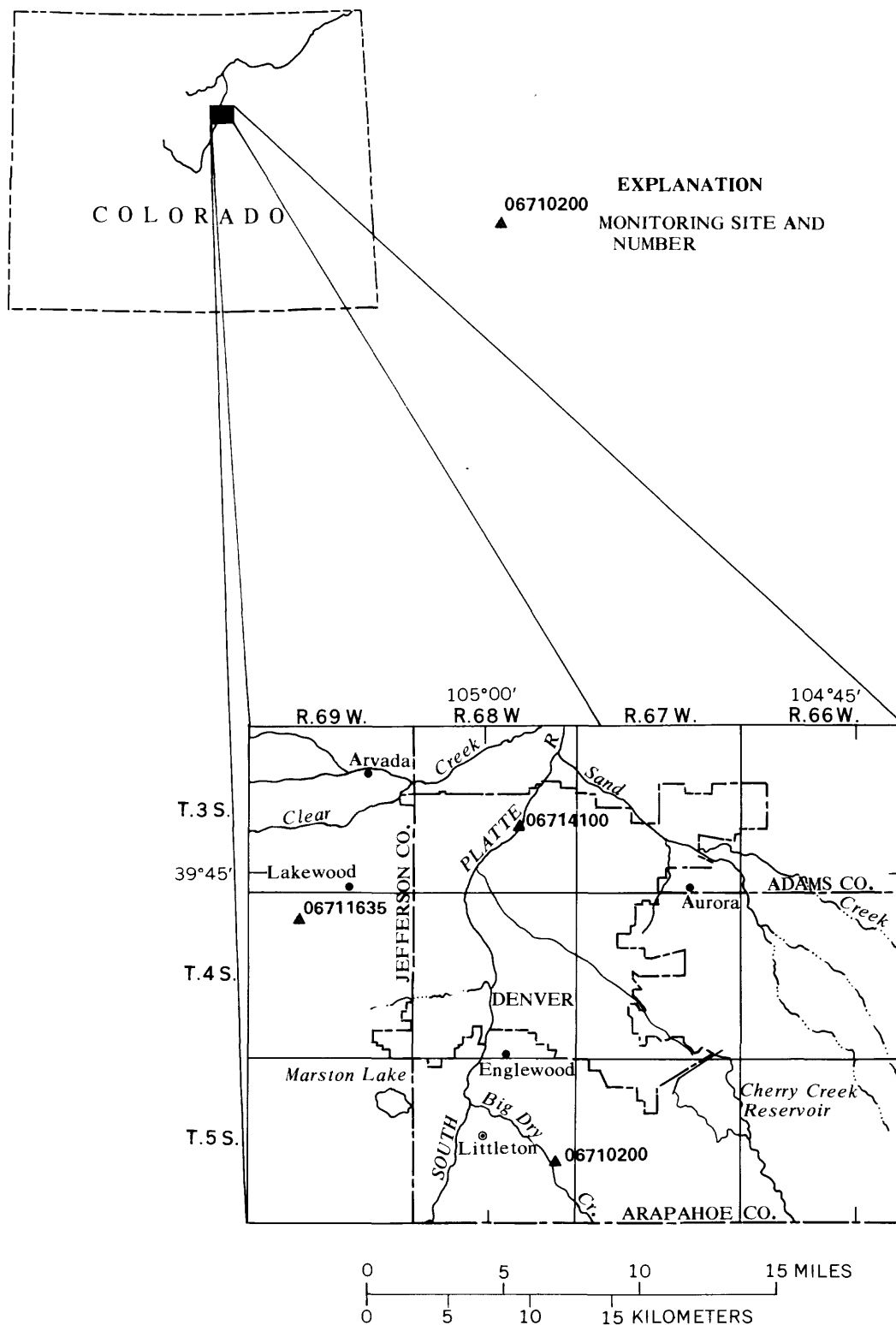


Figure 1.--Location of monitoring sites and general features.

Publication of the precipitation, hydraulic, and water-quality data is intended to serve two purposes:

1. To make the data available to planning, water-management, and environmental-protection agencies so that they may use the data to assist in assessing the impact of urban storm runoff on the hydrologic system.
2. To provide data needed to apply the U.S. Environmental Protection Agency's Storm Water Management Model II (Huber and others, 1975) or similar models to the catchment areas.

APPROACH

Automated water-quality sampling and rainfall-runoff monitors were installed at each site during February 1976. The automated monitor and its operation is described by Smoot, Davidian, and Billings (1974). Gage height-discharge relationships for sites 06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood, and 06714100 Thirty-sixth Street Storm Sewer at Denver, were derived using V-notch weirs and their theoretical ratings. The gage height-discharge relationship for site 06710200 Big Dry Creek tributary at Littleton was derived using the step-backwater approach (Shearman, 1976), supplemented by current-meter measurements.

Prior to February 1976, samples for water-quality analysis were collected from the three sites at times that were not correlated with rainfall runoff. These samples, referred to as miscellaneous samples in this report, were analyzed for numerous water-quality constituents to determine which water-quality constituents were to be analyzed in samples collected later in the investigation, following installation of the monitors.

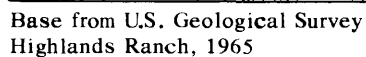
DESCRIPTION OF THE CATCHMENT AREAS

Littleton

The catchment area in Littleton (fig. 2) consists of 606 acres (0.95 square mile), of which approximately 75 percent is single-family dwellings and 25 percent is parks and open space. Approximately 15 percent of the catchment area is covered by effective impervious surfaces and 10 percent of the catchment area by noneffective impervious surfaces. The catchment area has essentially no storm-sewer system, relying mostly on street gutters and ditches for flow conveyance.

Three rain gages were installed in the catchment area (fig. 2). Rain gage 1 is located at the shelter housing the monitor, rain gage 2 is located at Newton Junior High School, and rain gage 3 is located at Ames Elementary School.

R.68 W. R.67 W.



5

Lakewood

The catchment area in Lakewood (pl. 1) consists of 76.7 acres (0.12 square mile), of which approximately 50 percent is undeveloped land, about 30 percent is multifamily dwellings, and about 20 percent is commercial development. Approximately 30 percent of the catchment area is covered by effective impervious surfaces and approximately 10 percent by noneffective impervious surfaces. A trunk storm sewer crosses the catchment area in the center of the southern one-half of the area. Street gutters convey the runoff to the storm sewer.

One rain gage was installed in the catchment area at the shelter housing the monitor (pl. 1). The rain gage probably provides adequate rainfall data for the catchment area except during localized thunderstorms.

Denver

The catchment area in Denver (pl. 2) consists of 2,246 acres (3.5 square miles), of which about 37 percent is multifamily dwellings, about 37 percent is mixed single-family and multifamily dwellings, about 20 percent is commercial development, and 6 percent is parks. Some of the high-use commercial areas, especially near the South Platte River, contain several small industrial establishments. Approximately 40 percent of the catchment area is covered by effective impervious surfaces and about 25 percent of the catchment area by noneffective impervious surfaces. The catchment area is completely underlain by a complex storm-sewer system that conveys the runoff through the Thirty-sixth Street storm sewer. The catchment area is representative of other parts of the city's urban center.

Three rain gages were installed in the catchment area (pl. 2). Rain gage 1 is located at the shelter housing the monitor, rain gage 2 is located at Gilpin Elementary School, and rain gage 3 is located at Morey Junior High School.

RAINFALL DATA

Daily average rainfall data for the Littleton catchment area are presented in table 2, for the Lakewood catchment area in table 3, and for the Denver catchment area in table 4. The rainfall data for the Littleton catchment area (table 2) and the Denver catchment area (table 4) represent the average rainfall for each catchment area based on data collected from all the rain gages.

Rainfall data for the Denver catchment area are presented only for 1976 because periodic instrument malfunctions prevented obtaining a complete record for 1977. Rainfall data for Denver for 1977 may be obtained from the National Weather Service and can be used to obtain an estimate of daily rainfall for the Denver catchment area.

Table 2.--*Estimated rainfall for 1976-77 from unofficial gages
for Littleton catchment area*

[Rainfall, in inches, reported at 0800 hours for the preceding 24 hours]

Day	1976						
	April	May	June	July	August	September	October
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	.00	.00	.02	.00	.27	.00	.00
3	.00	.00	.00	.00	.40	.00	.00
4	.00	.00	.00	.00	.19	.00	.00
5	.00	.00	.00	.00	.13	.00	.00
6	.00	.00	.00	.00	.00	.00	.00
7	.00	.13	.00	.00	.00	.00	.15
8	.00	.00	.00	.00	.00	.24	(¹)
9	.00	.00	.00	.00	.00	.11	---
10	.00	.00	.00	.00	.00	.00	---
11	.00	.00	.00	.00	.00	.00	---
12	.00	.00	.00	.00	.00	.00	---
13	.00	.00	.00	.04	.00	.00	---
14	.00	.00	.00	.00	.00	.06	---
15	.00	.00	.00	.00	.00	.00	---
16	.00	.00	.00	.00	.00	.05	---
17	.00	.05	.17	.00	.00	.00	---
18	.13	.00	.52	.00	.00	.00	---
19	.03	.00	.00	.00	.00	.00	---
20	.00	.00	.00	.06	.00	.00	---
21	.05	.10	.00	.00	.00	.00	---
22	.00	.45	.00	.00	.00	.00	---
23	.00	.00	.00	.00	.00	.21	---
24	.00	.00	.12	.00	.00	.00	---
25	.00	.02	.00	.00	.14	.00	---
26	.00	.00	.00	.28	.00	.23	---
27	.00	.00	.00	.10	.00	.59	---
28	.15	.00	.00	.00	.00	.00	---
29	.00	.00	.00	.00	.00	.00	---
30	.46	.00	.00	.00	.00	.00	---
31	---	.08	---	.00	.00	---	---

Table 2.--*Estimated rainfall for 1976-77 from unofficial gages
for Littleton catchment area--Continued*

Day	1977						
	April	May	June	July	August	September	October
1	0.00	0.00	0.01	---	---	---	---
2	.00	.02	.00	---	---	---	---
3	.00	.00	.00	---	---	---	---
4	.04	.00	.00	---	---	---	---
5	.01	.00	.00	---	---	---	---
6	.00	.00	.00	---	---	---	---
7	.00	.00	.00	---	---	---	---
8	.00	.00	.00	---	---	---	---
9	.00	.00	.00	---	---	---	---
10	.00	.00	.00	---	---	---	---
11	.00	.00	.00	---	---	---	---
12	.03	.00	.36	---	---	---	---
13	.07	.00	.01	---	---	---	---
14	.04	.01	.06	---	---	---	---
15	.00	.00	(²)	---	---	---	---
16	.22	.00	---	---	---	---	---
17	.00	.00	---	---	---	---	---
18	.00	.00	---	---	---	---	---
19	.05	.00	---	---	---	---	---
20	.27	.00	---	---	---	---	---
21	.03	.03	---	---	---	---	---
22	.00	.00	---	---	---	---	---
23	.00	.00	---	---	---	---	---
24	.00	.00	---	---	---	---	---
25	.00	.00	---	---	---	---	---
26	.00	.00	---	---	---	---	---
27	.00	.00	---	---	---	---	---
28	.00	.00	---	---	---	---	---
29	.00	.04	---	---	---	---	---
30	.00	.00	---	---	---	---	---
31	---	.00	---	---	---	---	---

¹Gage discontinued October 8, 1976.

²Gage discontinued June 14, 1977.

Table 3.--*Estimated rainfall for 1976-77 from unofficial gage
for Lakewood catchment area*

[Rainfall, in inches, reported at 0800 hours for the preceding 24 hours]

Day	1976						
	April	May	June	July	August	September	October
1	0.00	0.00	0.06	0.00	0.28	0.01	0.00
2	.00	.00	.00	.00	.02	.00	.00
3	.00	.00	.00	.00	.51	.00	.00
4	.00	.00	.00	.00	.10	.00	.00
5	.00	.00	.00	.00	.00	.00	.01
6	.00	.05	.00	.00	.00	.00	.00
7	.00	.00	.02	.00	.00	.00	.46
8	.00	.00	.00	.00	.00	.17	.03
9	.00	.00	.00	.00	.01	.02	.00
10	.00	.10	.00	.00	.04	.00	(¹)
11	.00	.00	.00	.00	.00	.00	---
12	.00	.00	.00	.00	.04	.00	---
13	.00	.00	.00	.00	.00	.00	---
14	.00	.00	.00	.00	.00	.26	---
15	.00	.00	.00	.00	.00	.59	---
16	.00	.11	.00	.00	.00	.06	---
17	.00	.00	.00	.00	.00	.00	---
18	.00	.00	1.02	.00	.11	.05	---
19	.00	.00	.15	.00	.02	.23	---
20	.12	.01	.00	.23	.00	.22	---
21	.00	.09	.00	.26	.00	.00	---
22	.00	.29	.00	.00	.00	.00	---
23	.00	.12	.07	.00	.00	.07	---
24	.00	.00	.06	.00	.01	.00	---
25	.00	.12	.00	.00	.05	.28	---
26	.09	.01	.00	.14	.00	.59	---
27	.06	.00	.00	.19	.00	.91	---
28	.11	.00	.00	.00	.00	.14	---
29	.00	.00	.00	.00	.00	.01	---
30	.37	.00	.00	.00	.00	.00	---
31	---	.00	---	.00	.00	---	---

Table 3.--*Estimated rainfall for 1976-77 from unofficial gage
for Lakewood catchment area--Continued*

Day	1977						
	April	May	June	July	August	September	October
1	---	0.00	---	---	---	---	---
2	---	.05	---	---	---	---	---
3	---	.00	---	---	---	---	---
4	0.00	.00	---	---	---	---	---
5	.00	.00	---	---	---	---	---
6	.00	.00	---	---	---	---	---
7	.00	.00	---	---	---	---	---
8	.00	.00	---	---	---	---	---
9	.00	.00	---	---	---	---	---
10	.00	.00	---	---	---	---	---
11	.16	.00	---	---	---	---	---
12	.28	.00	---	---	---	---	---
13	.29	.00	---	---	---	---	---
14	.02	.00	---	---	---	---	---
15	.49	.00	---	---	---	---	---
16	.21	.00	---	---	---	---	---
17	.00	.00	---	---	---	---	---
18	.01	.00	---	---	---	---	---
19	.03	.00	---	---	---	---	---
20	.74	.00	---	---	---	---	---
21	.06	.15	---	---	---	---	---
22	.00	(²)	---	---	---	---	---
23	.00	---	---	---	---	---	---
24	.00	---	---	---	---	---	---
25	.00	---	---	---	---	---	---
26	.00	---	---	---	---	---	---
27	.00	---	---	---	---	---	---
28	.00	---	---	---	---	---	---
29	.00	---	---	---	---	---	---
30	.00	---	---	---	---	---	---
31	---	---	---	---	---	---	---

¹Gage removed October 9, 1976.

²Gage removed May 21, 1977.

Table 4.--*Estimated rainfall for 1976 from unofficial gages
for Denver catchment area*

[Rainfall, in inches, reported at 0800 hours for the preceding 24 hours]

Day	April	May	June	July	August	September	October
1	0.00	0.00	0.00	0.00	0.90	0.00	0.00
2	.00	.00	.00	.00	.17	.00	.00
3	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.27	.00	.00
5	.00	.02	.00	.00	.00	.00	.00
6	.01	.02	.04	.00	.00	.00	.23
7	.01	.01	.02	.00	.02	.00	(¹)
8	.00	.00	.00	.00	.00	.00	---
9	.00	.00	.00	.00	.00	.00	---
10	.00	.00	.00	.00	.00	.00	---
11	.00	.00	.00	.00	.01	.00	---
12	.00	.00	.00	.01	.04	.00	---
13	.00	.00	.00	.00	.03	.02	---
14	.00	.00	.00	.00	.00	.23	---
15	.03	.02	.00	.00	.00	.08	---
16	.00	.00	.00	.00	.00	.00	---
17	.43	.00	.13	.00	.06	.02	---
18	.00	.00	.38	.00	.00	.00	---
19	.00	.00	.00	.28	.02	.27	---
20	.07	.02	.00	.34	.00	.00	---
21	.00	.23	.00	.38	.00	.00	---
22	.00	.23	.00	.00	.00	.15	---
23	.02	.00	.09	.05	.00	.00	---
24	.00	.01	.01	.00	.09	.00	---
25	.00	.08	.00	1.29	.00	.29	---
26	.06	.00	.06	.00	.00	.39	---
27	.36	.00	.00	.00	.00	.13	---
28	.00	.00	.00	.00	.00	.00	---
29	.19	.00	.00	.00	.00	.00	---
30	.38	.00	.00	.01	.00	.00	---
31	---	.00	---	.01	.07	---	---

¹Gage discontinued October 7, 1976.

RAINFALL-RUNOFF DATA

Rainfall-runoff data obtained for the Littleton catchment area are presented in tables 5 through 13. Estimated values of runoff in the tables were determined using two different methods. All estimated values of runoff, except those for April 29, August 1, and September 7, 1976, were determined by manual plotting of a hydrograph and estimating the beginning and ends of the hydrograph. Estimated values of runoff for April 29, August 1, and September 7, 1976, were made using the Storm Water Management Model II (Huber and others, 1975). These estimates are subject to revision because of continuing calibration refinement of the model.

Additional rainfall-runoff data for the Littleton catchment area are presented in two reports by Ducret and Hodges (1972, 1975). The data presented in their reports may not correlate with the data presented in this report because in the previous reports rainfall was measured at one rain gage located at the present site of the monitor instead of the three rain gages used in this investigation. Also, the flow record was obtained from different measuring devices at about the same location. The above-stated differences need to be considered when computer modeling of the catchment area is attempted.

Table 5.--*Rainfall-runoff data, April 29, 1976, for
station 06710200 Big Dry Creek tributary at Littleton*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1905	0.00 e	0.00	0.00	0.00
1910	.00 e	.01	.00	.00
1915	.00 e	.00	.00	.00
1920	.00 e	.00	.00	.00
1925	.02 e	.00	.00	.00
1930	.02 e	.00	.00	.00
1935	.03 e	.00	.00	.00
1940	.05 e	.00	.00	.00
1945	.06 e	.00	.01	.01
1950	.06 e	.00	.00	.01
1955	.06 e	.00	.00	.00
2000	.06 e	.00	.01	.00
2005	.08 e	.01	.00	.00
2010	.14 e	.00	.00	.00
2015	.26 e	.00	.00	.00
2020	.42 e	.00	.00	.01
2025	.55 e	.01	.01	.00
2030	.62 e	.00	.00	.01
2035	.66 e	.00	.00	.00
2040	.73 e	.01	.01	.00
2045	.03 e	.00	.00	.00
2050	.95 e	.00	.00	.01
2055	1.0 e	.00	.00	.00
2100	1.1 e	.01	.01	.01
2105	1.1 e	.02	.01	.01
2110	1.2 e	.01	.01	.01
2115	1.8 e	.00	.01	.01
2120	3.2 e	.01	.00	.00
2125	5.3 e	.01	.01	.00
2130	7.2 e	.01	.01	.01
2135	8.6 e	.01	.02	.01
2140	10 e	.01	.01	.01
2145	12 e	.00	.00	.01
2150	14 e	.01	.01	.00
2155	15 e	.00	.00	.01

Table 5.--Rainfall-runoff data, April 29, 1976, for
station 06710200 Big Dry Creek tributary at Littleton--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
2200	14 e	0.00	0.00	0.00
2205	13 e	.00	.00	.00
2210	12 e	.00	.00	.01
2215	10 e	.01	.01	.00
2220	9.1 e	.00	.00	.01
2225	8.1 e	.00	.00	.00
2230	7.7 e	.01	.01	.00
2235	7.7 e	.00	.00	.00
2240	7.8 e	.00	.00	.00
2245	7.8 e	.00	.01	.01
2250	7.6 e	.01	.00	.00
2255	7.1 e	.00	.00	.00
2300	6.8 e	.00	.00	.00
2305	6.6 e	.00	.00	.00
2310	6.5 e	.00	.00	.00
2315	6.0 e	.00	.00	.00
2320	5.2 e	.00	.00	.00
2325	4.4 e	.00	.01	.00
2330	3.9 e	.01	.00	.01
2335	3.3 e	.00	.01	.00
2340	3.3 e	.00	.00	.00
2345	3.8 e	.01	.00	.01
2350	4.4 e	.00	.00	.00
2355	5.1 e	.00	.00	.00

Table 6.--*Rainfall-runoff data, May 30, 1976, for
station 06710200 Big Dry Creek tributary at Littleton*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1325	0.00 e	0.02	0.02	0.00
1330	4.0 e	.07	.06	.02
1335	10 e	.05	.05	.02
1340	15	.07	.05	.05
1345	25	.04	.05	.05
1350	49	.02	.03	.02
1355	60	.02	.03	.02
1400	63	.01	.01	.00
1405	54	.00	.01	.00
1410	38	.00	.00	.00
1415	19	.00	.00	.00
1420	12	.00	.00	.00
1425	9.0 e	.00	.00	.00
1430	7.5 e	.00	.00	.00
1435	6.0 e	.00	.00	.00
1440	5.0 e	.00	.00	.00
1445	4.0 e	.00	.00	.00
1450	3.5 e	.00	.00	.00
1455	3.0 e	.00	.00	.00
1500	2.5 e	.00	.00	.00

Table 7.--*Rainfall-runoff data, July 25, 1976, for
station 06710200 Big Dry Creek tributary at Littleton*

[Rainfall is reported in amounts measured during specified time increments;
time increment is varied. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1730	0.00 e	0.01	0.05	0.00
1732	.00 e	.04	.07	.00
1734	.20 e	.03	.07	.02
1736	.80 e	.02	.05	.01
1738	1.5 e	.02	.02	.03
1740	3.0 e	.01	.01	.05
1742	5.0 e	.01	.00	.03
1744	12 e	.00	.00	.03
1746	30	.00	.00	.02
1748	43	.00	.01	.02
1750	52	.00	.00	.01
1752	60	.00	.00	.00
1754	65	.00	.00	.00
1756	67	.00	.00	.00
1758	69	.00	.00	.00
1800	68	.00	.00	.01
1802	66	.00	.00	.00
1804	62	.00	.00	.00
1806	55	.00	.00	.00
1808	46	.00	.00	.00
1810	34	.00	.00	.00
1812	24	.00	.00	.00
1814	15	.00	.00	.00
1816	13	.00	.00	.00
1818	9.0 e	.00	.00	.00
1820	7.0 e	.00	.00	.00
1822	5.5 e	.00	.00	.00
1824	5.0 e	.00	.00	.00
1832	4.5 e	.00	.00	.00
1836	4.0 e	.00	.00	.00
1840	3.8 e	.00	.00	.00
1844	3.5 e	.00	.00	.00
1858	3.3 e	.00	.00	.00
1902	3.0 e	.00	.00	.00
1906	2.8 e	.00	.00	.00

Table 7.--Rainfall-runoff data, July 25, 1976, for
station 06710200 Big Dry Creek tributary at Littleton--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1910	2.5 e	0.00	0.00	0.00
1924	2.3 e	.00	.00	.00
1928	2.0 e	.00	.00	.00
1932	1.8 e	.00	.00	.00
1936	1.5 e	.00	.00	.00
1948	1.2 e	.00	.00	.00
1952	1.0 e	.00	.00	.00
2006	.80 e	.00	.00	.00
2018	.70 e	.00	.00	.00
2022	.60 e	.00	.00	.00
2026	.50 e	.00	.00	.00

Table 8.--*Rainfall-runoff data, August 1, 1976, for station 06710200 Big Dry Creek tributary at Littleton*

[Rainfall is reported in amounts measured during specified time increments; time increment is 4 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
0150	0.00 e	0.00	0.01	0.02
0154	.00 e	.02	.01	.02
0158	.00 e	.01	.03	.01
0202	.05 e	.01	.01	.02
0206	.27 e	.02	.02	.01
0210	1.1 e	.02	.01	.01
0214	3.3 e	.00	.01	.01
0218	7.8 e	.01	.01	.00
0222	12 e	.01	.01	.00
0226	16 e	.01	.01	.02
0230	17 e	.01	.01	.01
0234	17 e	.01	.01	.01
0238	18 e	.02	.01	.02
0242	19 e	.01	.02	.01
0246	20 e	.02	.02	.02
0250	24 e	.01	.01	.01
0254	27 e	.01	.01	.01
0258	29 e	.01	.01	.01
0302	30 e	.01	.00	.01
0306	29 e	.00	.01	.00
0310	26 e	.01	.00	.01
0314	23 e	.00	.01	.00
0318	21 e	.01	.00	.00
0322	18 e	.00	.00	.00
0326	17 e	.00	.00	.00
0330	15 e	.00	.01	.01
0334	14 e	.00	.00	.00
0338	12 e	.00	.00	.00
0342	11 e	.00	.00	.00
0346	9.7 e	.00	.00	.00
0350	8.9 e	.00	.00	.00
0354	8.1 e	.00	.00	.00
0358	7.2 e	.00	.00	.00
0402	6.3 e	.00	.00	.00
0406	5.5 e	.00	.00	.00

Table 8.--Rainfall-runoff data, August 1, 1976, for
station 06710200 Big Dry Creek tributary at Littleton--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
0410	4.8 e	.00	.00	.00
0414	3.6 e	.00	.00	.00
0418	3.2 e	.00	.00	.00
0422	2.8 e	.00	.00	.00
0426	2.8 e	.00	.00	.00

Table 9.--*Rainfall-runoff data, September 7, 1976, for station 06710200 Big Dry Creek tributary at Littleton*

[Rainfall is reported in amounts measured during specified time increments; time increment is 2 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1502	0.00 e	0.00	0.00	0.05
1504	.00 e	.01	.00	.06
1506	.00 e	.00	.00	.03
1508	.00 e	.00	.00	.03
1510	.20 e	.00	.00	.02
1512	.50 e	.00	.00	.02
1514	.80 e	.00	.00	.03
1516	1.2 e	.01	.03	.03
1518	2.0 e	.03	.04	.02
1520	3.0 e	.01	.02	.04
1522	5.0 e	.02	.03	.01
1524	8.0 e	.03	.02	.01
1526	10 e	.01	.01	.00
1528	12	.00	.01	.00
1530	21	.00	.00	.00
1532	29	.00	.00	.00
1534	34	.01	.00	.00
1536	38	.00	.01	.01
1538	41	.01	.00	.00
1540	41	.01	.00	.00
1542	40	.00	.00	.00
1544	35	.00	.00	.00
1546	28	.00	.00	.00
1548	21	.00	.00	.00
1550	15	.00	.01	.01
1552	11	.00	.00	.00
1554	8.0 e	.00	.00	.00
1556	7.5 e	.01	.00	.01
1558	7.0 e	.01	.01	.00
1600	6.5 e	.00	.00	.00
1602	6.0 e	.02	.00	.01
1604	5.8 e	.03	.04	.02
1606	6.5 e	.03	.02	.02
1608	7.0 e	.03	.02	.01
1610	7.5 e	.02	.03	.02

Table 9.--Rainfall-runoff data, September 7, 1976, for
station 06710200 Big Dry Creek tributary at Littleton--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1612	8.0 e	0.01	0.03	0.03
1614	10 e	.02	.02	.02
1616	12	.01	.02	.02
1618	20	.01	.02	.02
1620	26	.02	.02	.01
1622	32	.01	.01	.01
1624	37	.01	.01	.01
1626	42	.01	.00	.00
1628	46	.00	.01	.01
1630	50	.01	.00	.00
1632	52	.00	.00	.00
1634	52	.00	.01	.01
1636	51	.01	.00	.01
1638	48	.02	.01	.00
1640	44	.01	.00	.00
1642	38	.01	.01	.01
1644	31	.00	.01	.01
1646	25	.00	.00	.00
1648	20	.01	.00	.00
1650	17	.00	.00	.00
1652	17	.00	.00	.00
1654	17	.00	.00	.00
1656	17	.00	.00	.00
1658	16	.00	.00	.00
1700	15	.00	.00	.00
1702	14	.00	.00	.00
1704	12	.00	.00	.00
1706	10 e	.00	.00	.00
1708	9.0 e	.00	.00	.00
1710	8.0 e	.00	.00	.00
1712	7.0 e	.00	.00	.00
1714	6.0 e	.00	.00	.00
1716	5.0 e	.00	.00	.00

Table 10.--*Rainfall-runoff data, April 15, 1977, for station 06710200 Big Dry Creek tributary at Littleton*

[Rainfall is reported in amounts measured during specified time increments; time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
0420	0.0 e	0.01	0.01	0.00
0425	.30 e	.01	.01	.01
0430	.60 e	.00	.00	.00
0435	1.2 e	.00	.01	.00
0440	2.0 e	.01	.01	.00
0445	2.5 e	.00	.00	.01
0450	3.0	.00	.00	.00
0455	2.5 e	.01	.01	.00
0500	2.5 e	.01	.00	.01
0505	2.5 e	.01	.01	.00
0510	2.5 e	.01	.02	.02
0515	3.0	.01	.01	.01
0520	3.8	.01	.01	.01
0525	6.8	.01	.01	.01
0530	8.5	.01	.01	.01
0535	8.7	.02	.02	.02
0540	8.3	.01	.01	.01
0545	9.1	.01	.02	.02
0550	9.8	.01	.01	.01
0555	14	.01	.01	.01
0600	14	.01	.01	.01
0605	13	.01	.01	.02
0610	14	.02	.02	.01
0615	14	.01	.01	.01
0620	19	.02	.01	.01
0625	22	.01	.01	.01
0630	20	.01	.02	.02
0635	21	.02	.02	.02
0640	25	.02	.02	.01
0645	27	.02	.01	.01
0650	29	.00	.01	.02
0655	28	.01	.01	.01
0700	25	.01	.02	.02
0705	22	.02	.01	.01
0710	21	.01	.01	.01
0715	25	.00	.01	.01

Table 10.--*Rainfall-runoff data, April 15, 1977, for station 06710200 Big Dry Creek tributary at Littleton--Continued*

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
0720	23	0.01	0.00	0.00
0725	21	.00	.01	.00
0730	17	.01	.00	.01
0735	12	.01	.01	.01
0740	11	.01	.01	.01
0745	11	.01	.01	.00
0750	12	.01	.01	.01
0755	12	.00	.01	.01
0800	12	.01	.01	.00
0805	14	.01	.01	.01
0810	11	.02	.01	.01
0815	12	.01	.02	.01
0820	14	.02	.01	.01
0825	18	.02	.02	.02
0830	19	.01	.02	.01
0835	22	.01	.02	.01
0840	24	.02	.01	.02
0845	26	.02	.02	.01
0850	28	.01	.02	.02
0855	28	.01	.02	.01
0900	27	.02	.01	.02
0905	30	.01	.02	.01
0910	31	.02	.02	.02
0915	33	.01	.01	.02
0920	32	.01	.01	.01
0925	30	.01	.01	.01
0930	30	.01	.01	.00
0935	28	.01	.01	.01
0940	26	.01	.00	.01
0945	24	.00	.01	.00
0950	21	.00	.00	.00
0955	17	.01	.00	.00
1000	13	.00	.01	.01
1005	11	.00	.00	.00
1010	9.5	.00	.00	.01

Table 10.--*Rainfall-runoff data, April 15, 1977, for station 06710200 Big Dry Creek tributary at Littleton--Continued*

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1015	7.7	0.01	0.00	0.00
1020	7.4	.00	.00	.00
1025	6.9	.00	.01	.00
1030	6.8	.00	.00	.00
1035	5.8	.00	.00	.00
1040	5.3	.00	.00	.00
1045	5.0	.00	.00	.01
1050	4.6	.00	.01	.00
1055	4.4	.01	.00	.01
1100	4.6	.00	.00	.00
1105	4.5	.00	.01	.00
1110	4.7	.00	.00	.00
1115	4.9	.00	.00	.00
1120	4.6	.00	.00	.00
1125	4.4	.01	.00	.00
1130	3.9	.00	.00	.01
1135	3.8	.00	.00	.00
1140	3.6	.00	.00	.00
1145	3.5	.00	.00	.00
1150	3.3	.00	.00	.00
1155	3.2	.00	.00	.00
1200	3.0	.00	.00	.00

Table 11.--*Rainfall-runoff data, April 18, 1977, for station 06710200 Big Dry Creek tributary at Littleton*

[Rainfall is reported in amounts measured during specified time increments; time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1445	0.00 e	0.00	0.01	0.00
1450	.00 e	.01	.01	.00
1455	.30 e	.01	.00	.00
1500	.60 e	.01	.02	.01
1505	1.0 e	.01	.02	.00
1510	2.0 e	.01	.01	.01
1515	3.0	.00	.00	.01
1520	3.8	.00	.00	.00
1525	3.3	.00	.00	.01
1530	3.6	.00	.01	.00
1535	3.2	.01	.00	.00
1540	2.7 e	.00	.00	.00
1545	2.5 e	.00	.00	.00
1550	2.4 e	.00	.00	.00
1555	2.0 e	.00	.00	.00
1600	2.0 e	.00	.00	.00
1605	1.9 e	.00	.00	.00
1610	1.8 e	.00	.00	.00
1615	1.7 e	.00	.00	.01
1620	1.6 e	.00	.01	.00
1625	1.5 e	.00	.00	.00

Table 12.--*Rainfall-runoff data, April 19, 1977, for station 06710200 Big Dry Creek tributary at Littleton*

[Rainfall is reported in amounts measured during specified time increments; time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1435	0.00 e	0.01	0.00	0.00
1440	.00 e	.00	.01	.01
1445	.00 e	.01	.00	.00
1450	.00 e	.00	.01	.00
1455	.00 e	.01	.00	.00
1500	.00 e	.00	.00	.01
1505	.20 e	.00	.01	.00
1510	.50 e	.00	.00	.00
1515	.80 e	.01	.00	.00
1520	1.0 e	.01	.01	.01
1525	2.0 e	.01	.01	.01
1530	3.0 e	.01	.01	.01
1535	3.4	.01	.02	.01
1540	3.6	.01	.01	.02
1545	5.5	.01	.01	.01
1550	7.7	.02	.02	.01
1555	10	.01	.01	.01
1600	12	.01	.01	.01
1605	13	.02	.01	.01
1610	13	.00	.01	.01
1615	11	.01	.01	.00
1620	8.3	.01	.00	.01
1625	6.5	.00	.01	.01
1630	5.5	.01	.01	.01
1635	5.1	.01	.01	.00
1640	5.2	.01	.01	.01
1645	5.2	.01	.00	.01
1650	6.3	.00	.01	.01
1655	7.1	.01	.01	.01
1700	8.1	.01	.01	.01
1705	7.7	.01	.01	.00
1710	8.3	.02	.01	.01
1715	9.1	.00	.01	.01
1720	9.8	.01	.01	.01
1725	12	.01	.01	.01

Table 12.--*Rainfall-runoff data, April 19, 1977, for station 06710200 Big Dry Creek tributary at Littleton--Continued*

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1730	11	0.01	0.00	0.00
1735	9.8	.01	.01	.01
1740	11	.01	.01	.01
1745	14	.01	.01	.01
1750	12	.00	.01	.00
1755	13	.01	.00	.00
1800	11	.01	.00	.01
1805	9.5	.00	.01	.00
1810	7.9	.00	.00	.01
1815	6.8	.00	.01	.00
1820	6.3	.01	.00	.00
1825	5.5	.00	.00	.00
1830	5.2	.00	.01	.01
1835	4.9	.01	.00	.00
1840	4.6	.00	.01	.01
1845	4.8	.01	.00	.00
1850	4.8	.01	.01	.01
1855	5.1	.01	.01	.00
1900	5.5	.01	.00	.01
1905	6.0	.00	.01	.00
1910	6.2	.01	.00	.01
1915	6.3	.00	.01	.00
1920	6.6	.01	.00	.00
1925	6.2	.00	.01	.01
1930	5.6	.00	.00	.00
1935	5.3	.01	.01	.00
1940	4.8	.00	.00	.00
1945	4.5	.00	.00	.01
1950	4.3	.01	.01	.00
1955	4.5	.00	.00	.00
2000	4.2	.00	.00	.01
2005	4.1	.00	.00	.00
2010	3.8	.00	.01	.00
2015	3.8	.01	.00	.00
2020	3.7	.00	.00	.01

Table 12.--*Rainfall-runoff data, April 19, 1977, for station 06710200 Big Dry Creek tributary at Littleton--Continued*

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
2025	3.6	0.00	0.00	0.00
2030	3.5	.01	.01	.00
2035	3.5	.00	.00	.00
2040	3.3	.00	.00	.00
2045	3.1	.00	.00	.01
2050	3.0	.01	.01	.00
2055	3.0	.00	.00	.00
2100	3.1	.01	.00	.00
2105	3.4	.00	.01	.01
2110	3.5	.01	.00	.00
2115	3.8	.00	.01	.01
2120	4.0	.01	.00	.00
2125	4.0	.00	.00	.00
2130	4.0	.00	.01	.00
2135	4.1	.01	.00	.01
2140	3.9	.00	.00	.00
2145	3.9	.01	.01	.00
2150	3.8	.00	.00	.01
2155	4.0	.01	.00	.00
2200	4.0	.00	.00	.00
2205	4.2	.01	.01	.01
2210	4.4	.00	.00	.00
2215	4.3	.00	.01	.00
2220	4.3	.01	.00	.00
2225	4.3	.00	.00	.01
2230	4.1	.00	.00	.00
2235	3.9	.00	.00	.00
2240	4.0	.00	.00	.00
2245	3.9	.00	.00	.00
2250	3.9	.00	.00	.00
2255	3.8	.00	.00	.00
2300	3.7	.00	.00	.00
2305	3.6	.00	.00	.00
2310	3.3	.00	.00	.00
2315	3.2	.00	.00	.00
2320	3.2	.00	.00	.00
2325	3.0	.00	.00	.00
2330	2.8	.00	.00	.00

Table 13.--*Rainfall-runoff data, June 11, 1977, for station 06710200 Big Dry Creek tributary at Littleton*

[Rainfall is reported in amounts measured during specified time increments; time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1455	0.00 e	0.03	0.01	Not working
1500	2.0 e	.06	.03	Do.
1505	3.0 e	.09	.03	Do.
1510	12	.04	.10	Do.
1515	30	.02	.08	Do.
1520	48	.01	.05	Do.
1525	61	.01	.01	Do.
1530	81	.04	.04	Do.
1535	91	.05	.05	Do.
1540	96	.02	.02	Do.
1545	90	.01	.01	Do.
1550	76	.01	.01	Do.
1555	60	.00	.00	Do.
1600	57	.00	.00	Do.
1605	44	.00	.00	Do.
1610	29	.00	.00	Do.
1615	21	.00	.00	Do.
1620	12	.00	.00	Do.
1625	9.1	.00	.00	Do.
1630	7.0	.00	.00	Do.
1635	5.5	.00	.00	Do.
1640	5.0	.00	.00	Do.
1645	4.6	.00	.00	Do.
1650	4.1	.00	.00	Do.
1655	4.0	.00	.00	Do.
1700	3.9	.00	.00	Do.
1705	3.5	.00	.00	Do.
1710	3.4	.00	.00	Do.
1715	3.0	.00	.00	Do.

Rainfall-runoff data obtained for the Lakewood catchment area are presented in tables 14 through 22. Prior to March 1977, accurate measurements of runoff could not be obtained because of supercritical flow in the storm drain, even though several different methods for measuring runoff were used. In March 1977, a 90-degree V-notch weir was installed in the storm drain that allowed accurate measurements of runoff to be made. The rainfall-runoff data obtained after March 1977 were used to calibrate the Storm Water Management Model II (Huber and others, 1975), which was then used to estimate the runoff prior to March 1977. These estimates are subject to revision because of calibration refinement of the model.

Table 14.--*Rainfall-runoff data, June 17, 1976, for station
06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
1300	0.00	0.01	1335	2.0 e	0.00
1305	.00	.04	1340	5.5 e	.00
1310	.02 e	.04	1350	3.2 e	.00
1315	.25 e	.03	1400	2.0 e	.00
1320	1.3 e	.02	1415	1.2 e	.01
1325	3.3 e	.02	1430	.88 e	.00
1330	5.3 e	.01	1500	.29 e	.00

Table 15.--*Rainfall-runoff data, July 19, 1976, for station
06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
1755	0.00	0.03	1900	1.4 e	0.01
1800	.00 e	.03	1905	1.2 e	.01
1805	.06 e	.05	1910	1.2 e	.00
1810	.50 e	.03	1915	1.4 e	.00
1815	2.2 e	.01	1920	1.6 e	.00
1820	4.6 e	.00	1925	1.6 e	.00
1825	6.2 e	.01	1930	1.6 e	.00
1830	5.3 e	.00	1935	1.3 e	.00
1835	3.9 e	.00	1940	1.1 e	.00
1840	3.0 e	.00	1945	.85 e	.00
1845	2.5 e	.00	1950	.68 e	.00
1850	2.1 e	.01	1955	.56 e	.00
1855	1.7 e	.00	2000	.46 e	.00

Table 16.--Rainfall-runoff data, September 14, 1976, for station
06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
1410	0.00 e	0.02	1500	2.5 e	0.00
1415	.00 e	.02	1505	2.1 e	.00
1420	.03 e	.08	1510	1.9 e	.00
1425	.37 e	.01	1515	1.5 e	.00
1430	2.0 e	.01	1520	1.2 e	.00
1435	4.5 e	.01	1525	.94 e	.00
1440	5.8 e	.00	1530	.75 e	.00
1445	5.0 e	.01	1535	.61 e	.00
1450	3.8 e	.00	1540	.50 e	.00
1455	3.0 e	.00			

Table 17--*Rainfall-runoff data, October 6, 1976, for station
06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
1000	0.00	0.01	1220	1.2 e	0.01
1010	.00 e	.01	1225	2.1 e	.01
1020	.03 e	.01	1230	3.0 e	.00
1025	.06 e	.01	1300	1.4 e	.00
1030	.10 e	.01	1320	.55 e	.02
1035	.18 e	.01	1325	.50 e	.02
1040	.29 e	.01	1330	.72 e	.01
1045	.47 e	.02	1335	1.4 e	.02
1050	.84 e	.02	1340	2.3 e	.02
1055	1.6 e	.00	1345	3.4 e	.01
1100	2.5 e	.01	1350	4.1 e	.02
1105	3.1 e	.00	1400	4.5 e	.01
1110	3.0 e	.01	1410	3.4 e	.01
1115	2.5 e	.02	1415	2.8 e	.00
1120	2.3 e	.02	1420	2.4 e	.00
1130	3.2 e	.00	1430	2.2 e	.00
1205	.97 e	.01	1450	1.2 e	.00
1210	.79 e	.02	1500	.75 e	.00
1215	.79 e	.02	1530	.26 e	.00

Table 18.--*Rainfall-runoff data, April 11, 1977, for station
06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
1420	0.00	0.01	1545	2.0	0.02
1425	.00	.00	1550	2.6	.01
1430	.00	.01	1555	3.0	.00
1435	.10	.00	1600	3.4	.02
1440	.20	.00	1605	3.3	.00
1445	.30	.00	1610	2.9	.01
1450	.30	.00	1615	2.3	.00
1455	.30	.01	1620	1.7	.00
1500	.30	.01	1625	1.3	.00
1505	.35	.00	1630	1.0	.00
1510	.35	.00	1635	.80	.00
1515	.40	.01	1640	.60	.00
1520	.60	.01	1645	.44	.00
1525	.70	.00	1650	.34	.00
1530	.80	.01	1655	.28	.00
1535	1.0	.01	1700	.23	.00
1540	1.4	.02	1705	.20	.00

Table 19.--Rainfall-runoff data, April 12, 1977, for station
06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood

[Rainfall is reported in amounts measured during specified time increments;
time increments are 2 or 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
1432	0.00	0.01	1606	2.3	0.01
1446	.00	.01	1608	2.3	.00
1500	.20	.00	1610	2.3	.00
1502	.26	.01	1612	2.4	.01
1504	.30	.00	1614	2.4	.00
1506	.32	.00	1616	2.5	.00
1508	.34	.01	1618	2.5	.01
1510	.38	.00	1620	2.4	.00
1512	.44	.00	1622	2.4	.00
1514	.57	.01	1625	2.3	.01
1516	.73	.01	1630	2.3	.01
1518	1.2	.01	1635	2.4	.00
1520	1.7	.00	1640	2.3	.01
1522	2.4	.01	1645	2.2	.00
1524	3.0	.00	1650	2.1	.00
1526	3.4	.00	1655	2.0	.00
1528	3.5	.01	1700	1.9	.01
1530	3.3	.00	1705	1.7	.00
1532	3.0	.00	1710	1.5	.00
1534	3.0	.01	1715	1.4	.01
1536	2.8	.00	1720	1.3	.00
1538	2.6	.01	1725	1.4	.01
1540	2.4	.00	1730	1.5	.00
1542	2.3	.01	1735	1.4	.00
1544	2.3	.00	1740	1.3	.00
1546	2.3	.01	1745	1.2	.00
1548	2.4	.00	1750	1.0	.01
1550	2.5	.01	1755	.93	.00
1552	2.6	.00	1800	.77	.00
1554	2.6	.00	1805	.65	.00
1556	2.6	.00	1810	.54	.00
1558	2.6	.01	1815	.49	.00
1600	2.5	.00	1820	.42	.00
1602	2.4	.01	1825	.36	.00
1604	2.4	.00	1830	.34	.00

Table 19.--*Rainfall-runoff data, April 12, 1977, for station 06711635
North Avenue Storm Drain at Denver Federal Center, at Lakewood--Continued*

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
1835	0.30	0.00	1945	0.08	0.00
1840	.26	.00	1950	.08	.00
1845	.24	.00	1955	.08	.00
1850	.21	.00	2000	.07	.00
1855	.19	.00	2005	.07	.00
1900	.18	.00	2010	.06	.00
1905	.16	.00	2015	.06	.00
1910	.15	.00	2020	.05	.00
1915	.14	.00	2025	.05	.00
1920	.12	.00	2030	.05	.00
1925	.11	.00	2035	.05	.00
1930	.10	.00	2040	.05	.00
1935	.10	.00	2045	.04	.00
1940	.09	.00			

Table 20.--*Rainfall-runoff data, April 15, 1977, for station
06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
0010	0.01	0.01	0305	0.70	0.02
0015	.01	.00	0310	1.0	.00
0020	.01	.01	0315	1.8	.00
0025	.01	.01	0320	1.5	.00
0030	.24	.00	0325	1.1	.00
0035	.96	.00	0330	.93	.01
0040	1.0	.01	0335	.70	.00
0045	.83	.00	0340	.54	.00
0050	.67	.00	0345	.44	.00
0055	.77	.00	0350	.40	.01
0100	.70	.00	0355	.40	.00
0105	.65	.01	0400	.40	.00
0110	.60	.00	0405	.40	.00
0115	.52	.00	0410	.38	.00
0120	.47	.00	0415	.36	.00
0125	.42	.00	0420	.34	.00
0130	.36	.00	0425	.32	.01
0135	.32	.00	0430	.32	.00
0140	.28	.00	0435	.30	.00
0145	.23	.00	0440	.30	.00
0150	.20	.00	0445	.30	.01
0155	.18	.00	0450	.34	.00
0200	.15	.00	0455	.40	.00
0205	.12	.00	0500	.49	.01
0210	.11	.00	0505	.57	.00
0215	.10	.00	0510	.62	.01
0220	.09	.00	0515	.70	.00
0225	.08	.00	0520	.90	.00
0230	.07	.00	0525	1.1	.01
0235	.06	.00	0530	1.2	.00
0240	.06	.01	0535	1.2	.01
0245	.05	.01	0540	1.2	.00
0250	.05	.00	0545	1.3	.01
0255	.24	.00	0550	1.4	.01
0300	.57	.00	0555	1.4	.01

Table 20.--Rainfall-runoff data, April 15, 1977, for station 06711635
North Avenue Storm Drain at Denver Federal Center, at Lakewood--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
0600	1.4	0.00	0755	3.8	0.01
0605	1.5	.01	0800	3.7	.01
0610	1.5	.01	0805	3.3	.01
0615	1.6	.01	0810	3.0	.00
0620	1.8	.01	0815	2.8	.01
0625	2.0	.01	0820	2.7	.01
0630	2.2	.01	0825	2.7	.01
0635	2.4	.01	0830	2.8	.01
0640	2.6	.02	0835	2.8	.01
0645	2.8	.01	0840	2.8	.01
0650	3.0	.01	0845	2.6	.01
0655	3.3	.02	0850	2.6	.01
0700	3.6	.01	0855	2.8	.01
0705	3.6	.01	0900	3.0	.02
0710	3.9	.02	0905	3.2	.01
0715	3.9	.02	0910	3.3	.01
0720	4.1	.01	0915	3.6	.01
0725	4.3	.02	0920	3.6	.02
0730	4.3	.01	0925	3.8	.01
0735	3.9	.01	0930	3.9	.01
0740	3.8	.01	0935	3.9	.01
0745	3.6	.01	0940	3.9	.01
0750	3.8	.01			

Table 21.--*Rainfall-runoff data, April 19-20, 1977, for station 06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood*

[Rainfall is reported in amounts measured during specified time increments; time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
1340	0.01	0.01	1640	2.5	0.01
1350	.01	.01	1645	2.4	.01
1355	.01	.01	1650	2.4	.01
1400	.54	.01	1655	2.4	.00
1405	1.0	.00	1700	2.5	.01
1410	1.0	.01	1705	2.5	.01
1415	1.4	.00	1710	2.4	.00
1420	1.5	.01	1715	2.3	.01
1425	1.6	.01	1720	2.0	.00
1430	1.6	.01	1725	1.9	.01
1435	1.7	.01	1730	1.9	.00
1440	2.2	.01	1735	1.8	.00
1445	2.1	.01	1740	1.7	.01
1450	2.0	.02	1745	1.6	.00
1455	2.3	.01	1750	1.6	.01
1500	2.8	.01	1755	1.7	.01
1505	3.1	.01	1800	1.8	.00
1510	2.9	.01	1805	1.9	.01
1515	2.7	.02	1810	2.0	.01
1520	2.8	.01	1815	2.2	.01
1525	3.0	.02	1820	2.5	.01
1530	3.3	.01	1825	2.6	.01
1535	3.3	.01	1830	2.8	.01
1540	3.3	.02	1835	2.8	.01
1545	3.3	.00	1840	3.0	.01
1550	3.0	.01	1845	3.3	.01
1555	2.8	.01	1850	3.3	.01
1600	2.7	.01	1855	3.3	.01
1605	2.6	.01	1900	3.3	.00
1610	2.6	.01	1905	3.1	.00
1615	2.5	.01	1910	2.8	.01
1620	2.6	.01	1915	2.8	.01
1625	2.8	.01	1920	2.7	.01
1630	2.8	.01	1925	2.5	.01
1635	2.6	.00	1930	2.3	.00

Table 21.--Rainfall-runoff data, April 19-20, 1977, for station 06711635
North Avenue Storm Drain at Denver Federal Center, at Lakewood--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
1935	2.2	0.01	2230	0.96	0.00
1940	2.1	.00	2235	.96	.00
1945	2.2	.01	2240	.96	.00
1950	2.2	.01	2245	.96	.00
1955	2.3	.01	2250	.96	.00
2000	2.4	.00	2255	.96	.00
2005	2.4	.01	2300	.96	.00
2010	2.4	.01	2305	.96	.00
2015	2.4	.00	2310	.93	.00
2020	2.3	.01	2315	.93	.00
2025	2.3	.01	2320	.93	.00
2030	2.3	.00	2325	1.2	.00
2035	2.3	.01	2330	1.2	.00
2040	2.3	.01	2335	1.3	.00
2045	2.4	.01	2340	1.2	.00
2050	2.5	.00	2345	1.3	.00
2055	2.6	.01	2350	1.4	.00
2100	2.4	.01	2355	1.5	.00
2105	2.4	.00	2400	1.6	.00
2110	2.6	.00	0005	1.7	.00
2115	2.9	.00	0010	1.9	.00
2120	2.8	.01	0015	1.9	.00
2125	2.5	.00	0020	1.9	.00
2130	1.9	.00	0025	1.9	.00
2135	1.6	.00	0030	1.8	.00
2140	1.4	.00	0035	1.7	.00
2145	1.2	.00	0040	1.6	.00
2150	1.1	.00	0045	1.5	.00
2155	1.1	.00	0050	1.5	.00
2200	1.0	.00	0055	1.4	.00
2205	1.0	.00	0100	1.3	.00
2210	1.0	.00	0105	1.2	.00
2215	1.0	.00	0110	1.2	.00
2220	1.0	.00	0115	1.1	.00
2225	.96	.00	0120	1.0	.00

Table 21.--*Rainfall-runoff data, April 19-20, 1977, for station 06711635
North Avenue Storm Drain at Denver Federal Center, at Lakewood--Continued*

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
0125	1.0	0.00	0345	0.57	0.00
0130	1.0	.00	0350	.54	.00
0135	1.0	.00	0355	.54	.00
0140	1.0	.00	0400	.52	.00
0145	1.0	.00	0405	.49	.00
0150	.96	.00	0410	.49	.00
0155	.96	.00	0415	.47	.00
0200	.96	.00	0420	.47	.00
0205	.96	.00	0425	.44	.00
0210	.93	.00	0430	.42	.00
0215	.93	.00	0435	.40	.00
0220	.90	.00	0440	.38	.00
0225	.90	.00	0445	.38	.00
0230	.87	.00	0450	.36	.00
0235	.83	.00	0455	.36	.00
0240	.83	.00	0500	.34	.00
0245	.80	.00	0505	.34	.00
0250	.80	.00	0510	.32	.00
0255	.77	.00	0515	.32	.00
0300	.73	.00	0520	.30	.00
0305	.70	.00	0525	.30	.00
0310	.67	.00	0530	.28	.00
0315	.67	.00	0535	.28	.00
0320	.65	.00	0540	.28	.00
0325	.65	.00	0545	.26	.00
0330	.65	.00	0550	.26	.00
0335	.60	.00	0555	.24	.00
0340	.60	.00			

Table 22.--*Rainfall-runoff data, May 20, 1977, for station
06711635 North Avenue Storm Drain at Denver Federal Center, at Lakewood*

[Rainfall is reported in amounts measured during specified time increments:
time increment is 2 minutes 1418 to 1444; 5 minutes 1445 to 2100]

Time	Discharge, in ft ³ /s	Rainfall, in inches	Time	Discharge, in ft ³ /s	Rainfall, in inches
1418	0.01	0.01	1530	0.24	0.00
1430	.30	.01	1935	.02	.01
1432	.44	.01	1945	.02	.02
1434	.57	.00	1950	.12	.02
1436	.73	.00	1955	3.4	.01
1438	.90	.01	2000	3.2	.01
1440	1.1	.00	2005	2.3	.00
1442	1.2	.00	2010	1.5	.00
1444	1.3	.01	2015	1.4	.00
1445	1.2	.00	2020	1.1	.00
1450	1.0	.00	2025	.96	.00
1455	.83	.00	2030	.77	.00
1500	.67	.00	2035	.63	.00
1505	.65	.00	2040	.49	.00
1510	.54	.00	2045	.40	.00
1515	.42	.00	2050	.34	.00
1520	.36	.00	2055	.28	.00
1525	.30	.00	2100	.20	.00

Rainfall-runoff data obtained for the Denver catchment area are presented in tables 23 through 36. Prior to March 1977, accurate measurements of runoff between about 40 cubic feet per second and 100 cubic feet per second could not be obtained at times because of supercritical flow in the storm sewer. Estimated values of runoff for these periods were determined by comparison with similar runoff records without supercritical flow. These estimates are subject to revision because of possible calibration of the Storm Water Management Model II (Huber and others, 1975). In March 1977, an energy dissipator was installed "upstream" from the V-notch weir which reduced flow velocities through the weir to subcritical velocities enabling accurate measurements of runoff.

Table 23.--*Rainfall-runoff data, April 29-30, 1976, for station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments; time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
2105	0.20	0.01	0.01	0.00
2110	.20	.00	.00	.00
2115	.20	.00	.00	.01
2120	.20	.01	.01	.00
2125	.20	.00	.00	.01
2130	.20	.01	.00	.00
2135	.20	.00	.01	.00
2140	.20	.01	.00	.01
2145	.20	.00	.01	.00
2150	.20	.00	.01	.00
2155	1.0	.01	.00	.01
2200	3.1	.01	.01	.01
2205	5.0	.00	.01	.01
2210	6.9	.01	.01	.01
2215	10	.01	.00	.01
2220	14	.01	.01	.01
2225	20	.00	.02	.01
2230	29	.01	.01	.01
2235	35	.01	.01	.01
2240	42	.01	.01	.01
2245	48 e	.01	.01	.01
2250	55 e	.01	.01	.01
2255	60 e	.01	.01	.00
2300	65 e	.01	.00	.01
2305	68 e	.01	.01	.00
2310	70 e	.01	.01	.01
2315	68 e	.00	.01	.01
2320	65 e	.01	.00	.00
2325	63 e	.00	.00	.00
2330	60 e	.00	.00	.00
2335	55 e	.00	.00	.00
2340	50 e	.00	.01	.00
2345	46 e	.00	.00	.00
2350	42	.01	.00	.00
2355	38	.00	.00	.00

Table 23.--*Rainfall-runoff data, April 29-30, 1976, for station 06714100 Thirty-sixth Street Storm Sewer at Denver--Continued*

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
2400	33	0.00	0.00	0.00
0005	29	.00	.00	.00
0010	25	.00	.00	.00
0015	23	.00	.00	.00
0020	21	.00	.00	.00
0025	20	.00	.00	.00
0030	18	.00	.00	.00
0035	17	.00	.00	.00
0040	15	.00	.00	.01
0045	13	.00	.00	.00
0050	12	.00	.00	.00
0055	11	.00	.00	.00
0100	10	.00	.00	.00
0105	10	.00	.00	.00
0110	9.0	.00	.00	.00
0115	9.0	.00	.00	.00
0120	8.0	.00	.00	.00
0125	7.0	.00	.00	.00
0130	5.9	.00	.00	.00
0135	5.5	.00	.00	.00
0140	5.1	.00	.00	.00
0145	4.8	.00	.00	.00
0150	4.3	.00	.00	.00
0155	4.0	.01	.01	.00
0200	3.5	.00	.00	.00
0205	3.1	.01	.01	.00
0210	3.0	.01	.01	.01
0215	2.8	.00	.01	.00
0220	3.0	.01	.00	.00
0225	3.5	.00	.00	.00
0230	3.0	.01	.01	.01
0235	3.1	.01	.00	.01
0240	3.5	.00	.01	.00
0245	3.5	.01	.00	.00
0250	3.8	.01	.01	.01

Table 23.--*Rainfall-runoff data, April 29-30, 1976, for station 06714100 Thirty-sixth Street Storm Sewer at Denver--Continued*

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
0255	3.9	.01	.01	.00
0300	4.0	.02	.00	.01
0305	4.2	.01	.01	.00
0310	4.5	.01	.01	.01
0315	4.5	.00	.00	.01
0320	4.2	.01	.01	.00
0325	4.2	.00	.01	.01
0330	4.0	.01	.00	.01
0335	4.3	.00	.01	.01
0340	4.3	.01	.01	.01
0345	4.5	.01	.01	.00
0350	4.9	.00	.00	.01
0355	4.5	.01	.01	.00
0400	4.5	.00	.01	.01

Table 24.--*Rainfall-runoff data, May 24, 1976, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1925	0.15	0.00	0.01	0.00
1930	.15	.01	.00	.00
2005	.16	.00	.00	.01
2035	.70	.00	.01	.00
2100	2.4	.00	.00	.00
2105	4.3	.00	.00	.00
2110	4.5	.00	.00	.00
2115	4.6	.00	.00	.00
2120	4.5	.00	.00	.00
2125	3.8	.00	.00	.00
2130	3.5	.00	.00	.00
2135	3.0	.00	.00	.00
2145	2.2	.00	.00	.00
2155	1.7	.00	.00	.00
2205	1.3	.00	.00	.00
2215	1.2	.00	.00	.00
2225	.98	.00	.00	.00
2235	.84	.00	.00	.00
2245	.67	.00	.00	.00
2255	.57	.00	.00	.00
2305	.52	.00	.00	.00
2315	.44	.00	.00	.00
2325	.42	.00	.00	.00
2335	.39	.00	.00	.00
2345	.39	.00	.00	.00
2355	.37	.00	.00	.00

Table 25.--*Rainfall-runoff data, May 25, 1976, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
0045	0.23	0.00	0.00	0.03
0050	.23	.03	.04	.06
0055	.23	.00	.01	.00
0100	1.6	.00	.00	.01
0105	6.5	.00	.00	.01
0110	3.9	.00	.00	.00
0115	6.7	.00	.00	.00
0120	5.1	.00	.00	.00
0125	1.8	.00	.00	.00
0130	11	.01	.01	.00
0135	25	.00	.00	.00
0140	43	.00	.00	.00
0145	34	.00	.00	.00
0150	26	.00	.00	.00
0155	22	.00	.00	.00
0200	20	.00	.00	.00
0205	18	.00	.00	.00
0210	16	.00	.00	.00
0215	14	.00	.00	.00
0220	12	.00	.00	.00
0225	11	.00	.00	.00
0230	10	.00	.00	.00
0235	8.9	.00	.00	.00
0240	8.0	.00	.00	.00
0245	7.0	.00	.00	.00
0300	4.7	.00	.00	.00
0400	1.9	.00	.00	.00
0535	1.0	.00	.00	.00

Table 26.--*Rainfall-runoff data, July 25-26, 1976, for station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments; time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
2115	0.31	0.00	0.00	0.00
2120	.31	.01	.00	.00
2125	.31	.02	.00	.01
2130	.44	.09	.02	.00
2135	6.3	.15	.12	.03
2140	32	.16	.09	.01
2145	42	.11	.09	.04
2150	50 e	.03	.08	.08
2155	65 e	.03	.03	.03
2200	80 e	.05	.06	.02
2205	95 e	.01	.07	.04
2210	109	.00	.03	.07
2215	127	.00	.00	.01
2220	97	.01	.00	.01
2225	113	.01	.03	.01
2230	174	.00	.00	.01
2235	184 e	.00	.00	.00
2240	197 e	.00	.00	.00
2245	209 e	.00	.00	.00
2250	163 e	.00	.00	.00
2255	114 e	.00	.00	.00
2300	83 e	.00	.00	.00
2305	60 e	.00	.00	.01
2310	42	.01	.01	.01
2315	34	.00	.00	.00
2320	30	.00	.00	.01
2325	25	.00	.00	.00
2330	22	.00	.00	.00
2335	20	.00	.00	.00
2340	19	.00	.00	.00
2345	20	.00	.00	.00
2350	21	.00	.00	.00
2355	21	.00	.00	.00
2400	19	.00	.00	.00
0005	17	.00	.00	.00

Table 26.--*Rainfall-runoff data, July 25-26, 1976, for station 06714100 Thirty-sixth Street Storm Sewer at Denver--Continued*

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
0010	17	0.00	0.00	0.00
0015	15	.00	.00	.00
0020	13	.00	.00	.00
0025	11	.00	.00	.00
0030	10	.01	.01	.00
0035	8.9	.01	.01	.00
0040	8.2	.00	.00	.00
0045	8.0	.00	.01	.00
0050	8.0	.00	.00	.01
0055	7.8	.00	.00	.00
0100	7.8	.00	.00	.00
0130	7.8	.00	.00	.00
0200	4.3	.00	.00	.00
0230	2.8	.00	.00	.00
0300	2.0	.00	.00	.00
0330	1.4	.00	.00	.00
0400	1.3	.00	.00	.00
0430	1.0	.00	.00	.00

Table 27.--Rainfall-runoff data, August 1, 1976, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1450	0.24	0.01	0.00	0.00
1455	.24	.09	.06	.06
1500	12	.06	.21	.22
1505	19	.05	.12	.06
1510	26	.07	.01	.01
1515	49	.02	.01	.00
1520	75	.02	.00	.00
1525	122	.01	.01	.00
1530	150	.00	.01	.00
1535	133	.01	.01	.01
1540	165	.00	.01	.02
1545	184 e	.01	.02	.07
1550	163 e	.03	.01	.03
1555	128 e	.04	.00	.00
1600	111 e	.04	.03	.00
1605	95 e	.03	.01	.00
1610	83 e	.00	.01	.00
1615	71 e	.00	.01	.00
1620	60 e	.01	.00	.00
1635	50 e	.00	.00	.00
1640	40 e	.00	.00	.00
1645	31	.00	.00	.00
1650	29	.00	.00	.00
1655	24	.00	.00	.00
1700	21	.00	.00	.00
1705	18	.00	.00	.00
1710	16	.00	.00	.00
1715	14	.00	.00	.00
1720	12	.00	.00	.00
1725	11	.00	.00	.00
1730	9.8	.00	.00	.00
1735	8.4	.00	.00	.00
1740	7.8	.00	.00	.00
1745	6.5	.00	.00	.00
1750	5.9	.00	.00	.00

Table 27.--*Rainfall-runoff data, August 1, 1976, for station 06714100 Thirty-sixth Street Storm Sewer at Denver*--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1755	5.4	0.00	0.00	0.00
1800	4.9	.00	.00	.00
1805	4.5	.00	.00	.00
1810	3.9	.00	.00	.00
1815	3.8	.00	.00	.00
1820	3.3	.00	.00	.00
1825	3.1	.00	.00	.00
1830	2.9	.00	.00	.00
1835	2.7	.00	.00	.00
1840	2.5	.00	.00	.00
1845	2.4	.00	.00	.00
1850	2.1	.00	.00	.00
1855	2.0	.00	.00	.00
1900	1.9	.00	.00	.00
1905	1.8	.00	.00	.00
1910	1.7	.00	.00	.00
1915	1.6	.00	.00	.00
1920	1.5	.00	.00	.00
1925	1.5	.00	.00	.00
1930	1.5	.00	.00	.00
1935	1.4	.00	.00	.00
1940	1.4	.00	.00	.00
1945	1.3	.00	.00	.00
1950	1.2	.00	.00	.00
1955	1.2	.00	.00	.00
2000	1.1	.00	.00	.00
2005	1.0	.00	.00	.00

Table 28.--*Rainfall-runoff data, August 2, 1976, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes. e indicates estimated discharge]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1020	0.26	0.00	0.01	0.00
1155	1.1	.00	.00	.01
1200	.91	.00	.01	.01
1205	.98	.01	.02	.02
1210	1.1	.02	.02	.02
1215	1.4	.02	.03	.02
1220	4.5	.02	.01	.01
1225	12	.01	.01	.02
1230	40	.01	.01	.01
1232	50 e	.00	.00	.00
1235	52 e	.01	.01	.00
1240	55 e	.01	.00	.01
1245	58 e	.00	.01	.00
1250	55 e	.00	.00	.00
1255	52 e	.00	.00	.01
1300	47 e	.00	.00	.02
1305	45 e	.00	.01	.01
1310	42	.01	.01	.01
1315	42	.01	.01	.00
1320	42	.00	.00	.00
1325	42	.00	.00	.00
1330	43 e	.01	.00	.00
1335	46 e	.01	.00	.00
1340	40	.00	.00	.00
1345	38	.00	.00	.00
1350	26	.00	.00	.00
1355	26	.00	.00	.00
1400	21	.00	.00	.00
1405	19	.00	.00	.00
1410	17	.00	.00	.00
1415	13	.00	.00	.00
1420	13	.00	.00	.00

Table 29.--*Rainfall-runoff data, August 24, 1976, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
2030	0.40	0.06	0.00	0.00
2035	.65	.04	.10	.01
2040	11	.00	.02	.02
2045	18	.00	.00	.02
2050	29	.00	.00	.00
2055	35	.00	.00	.00
2100	42	.00	.00	.00
2105	42	.00	.00	.00
2110	38	.00	.00	.00
2115	33	.00	.00	.00
2120	32	.00	.00	.00
2125	30	.00	.00	.00
2130	25	.00	.00	.00
2140	17	.00	.00	.00
2150	12	.00	.00	.00
2200	8.9	.00	.00	.00
2215	5.3	.00	.00	.00
2230	3.3	.00	.00	.00
2245	2.3	.00	.00	.00
2300	1.5	.00	.00	.00
2315	1.2	.00	.00	.00
2330	.98	.00	.00	.00

Table 30.--*Rainfall-runoff data, October 6, 1976, for station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments; time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1025	0.28	0.00	0.01	0.01
1030	.28	.00	.00	.01
1040	.37	.01	.00	.00
1055	.37	.00	.01	.00
1100	.37	.00	.00	.01
1105	.37	.01	.01	.00
1110	.37	.01	.00	.01
1115	.46	.01	.02	.01
1120	1.0	.01	.01	.01
1125	11	.02	.03	.02
1130	18	.01	.02	.02
1135	25	.01	.01	.00
1140	73	.00	.00	.01
1145	101	.00	.00	.00
1150	163	.00	.00	.01
1155	156	.00	.01	.00
1200	149	.01	.01	.00
1205	71	.00	.00	.01
1210	60	.01	.01	.00
1215	52	.00	.01	.01
1220	40	.01	.01	.01
1225	34	.01	.0	.01
1230	35	.00	.01	.01
1235	36	.01	.01	.01
1240	42	.01	.01	.01
1245	48	.01	.01	.01
1250	54	.00	.01	.01
1255	60	.01	.01	.01
1300	65	.00	.00	.02
1305	71	.00	.00	.00
1310	64	.00	.00	.00
1315	57	.00	.00	.00
1320	50	.00	.00	.00
1330	55	.00	.00	.00
1340	38	.00	.00	.00

Table 30.--Rainfall-runoff data, October 6, 1976, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1350	27	0.00	0.00	0.00
1405	14	.00	.00	.00
1420	11	.00	.00	.00
1435	7.4	.00	.00	.00
1450	4.8	.00	.00	.00
1515	2.6	.00	.00	.00

Table 31.--*Rainfall-runoff data, May 20, 1977, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1450	0.74	0.01	0.02	0.02
1455	.70	.00	.04	.02
1500	.67	.00	.02	.02
1505	.70	.01	.00	.00
1510	4.2	.00	.01	.01
1515	84	.00	.00	.00
1520	99	.00	.00	.01
1525	94	.00	.00	.00
1530	76	.00	.00	.00
1535	56	.00	.00	.00
1540	45	.00	.00	.00
1545	36	.00	.00	.00
1550	32	.00	.00	.00
1555	25	.00	.00	.00
1600	21	.00	.00	.00
1605	18	.00	.00	.00
1610	15	.00	.00	.00
1615	13	.00	.00	.00
1620	11	.00	.00	.00
1625	9.3	.00	.00	.00
1630	8.0	.00	.00	.00
1635	6.5	.00	.00	.00
1640	5.4	.00	.00	.00
1645	4.6	.00	.00	.00
1650	3.9	.00	.00	.00
1655	3.3	.00	.00	.00
1700	2.9	.00	.00	.00
1705	2.4	.00	.00	.00
1710	2.1	.00	.00	.00
1715	1.8	.00	.00	.00
1720	1.6	.00	.00	.00
1725	1.4	.00	.00	.00
1730	1.3	.00	.00	.00
1735	1.2	.00	.00	.00
1740	1.1	.00	.00	.00

Table 32.--*Rainfall-runoff data, May 28, 1977, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
800	0.12	0.01	0.00	0.01
805	.12	.00	.01	.02
850	1.8	.00	.00	.00
855	8.2	.00	.00	.00
900	7.4	.00	.00	.00
905	6.1	.00	.00	.00
910	4.8	.00	.00	.00
915	3.9	.00	.00	.00
920	3.1	.00	.00	.00
925	2.7	.00	.00	.00
930	2.3	.00	.00	.00
935	2.0	.00	.00	.00
940	1.7	.00	.00	.00
945	1.4	.00	.00	.00
950	1.2	.00	.00	.00
955	1.1	.00	.00	.00
1000	.98	.00	.00	.00
1010	.74	.00	.01	.00
1020	.62	.00	.00	.01
1130	.54	.00	.00	.01
1135	.49	.01	.00	.00
1140	.44	.00	.00	.01
1145	.42	.00	.01	.01
1150	.39	.00	.00	.01
1155	.35	.00	.01	.01
1200	.33	.01	.01	.00
1205	.33	.02	.02	.01
1210	.57	.00	.01	.01
1215	2.7	.02	.01	.00
1220	36	.00	.00	.00
1225	47	.01	.01	.00
1230	52	.00	.00	.00
1235	43	.01	.00	.00
1240	40	.00	.00	.01
1245	33	.00	.00	.00

Table 32.--Rainfall-runoff data, May 28, 1977, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1250	29	0.00	0.00	0.00
1255	25	.00	.00	.00
1300	21	.00	.00	.00
1305	19	.00	.00	.00
1310	16	.00	.00	.00
1315	14	.00	.00	.00
1320	13	.00	.00	.00
1325	11	.00	.00	.00
1330	9.3	.00	.00	.00
1335	8.0	.00	.00	.00
1340	7.0	.00	.00	.00
1345	5.7	.00	.00	.00
1350	4.9	.00	.00	.00
1355	4.2	.00	.00	.00
1400	3.6	.00	.00	.00
1405	3.0	.00	.00	.00
1410	2.7	.00	.00	.00
1415	2.2	.00	.00	.00
1420	2.0	.00	.00	.00
1425	1.7	.00	.00	.00
1430	1.5	.00	.00	.00
1435	1.4	.00	.00	.00
1440	1.2	.00	.00	.00
1445	1.1	.00	.00	.00
1635	.26	.00	.00	.00
1640	.26	.01	.00	.00
1645	.25	.00	.01	.00
1750	.23	.02	.00	.00
1755	.24	.01	.00	.00
1800	.26	.01	.00	.00

Table 33.--*Rainfall-runoff data, June 5-6, 1977, for station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments; time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
2225	0.18	0.00	0.00	0.01
2245	.17	.01	.00	.01
2250	.16	.00	.04	.01
2255	.15	.01	.03	.00
2300	.16	.02	.01	.01
2305	.28	.01	.01	.00
2310	1.9	.00	.00	.01
2315	36	.00	.01	.00
2320	37	.00	.00	.01
2325	33	.00	.01	.01
2330	28	.01	.01	.02
2335	26	.00	.00	.00
2340	28	.00	.00	.00
2345	35	.00	.00	.01
2350	45	.01	.01	.00
2355	50	.00	.00	.01
2400	54	.01	.01	.00
0005	47	.01	.01	.01
0010	43	.02	.01	.00
0015	42	.00	.01	.01
0020	45	.00	.01	.00
0025	38	.01	.00	.00
0030	40	.00	.00	.01
0035	55	.00	.00	.00
0040	38	.00	.00	.00
0045	37	.00	.00	.00
0050	32	.01	.01	.01
0055	28	.00	.01	.01
0100	24	.02	.01	.01
0105	23	.01	.01	.01
0110	22	.01	.01	.00
0115	26	.00	.01	.01
0120	38	.01	.01	.00
0125	48	.00	.00	.01
0130	47	.01	.01	.01

Table 33.--Rainfall-runoff data, June 5-6, 1977, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
0135	50	0.01	0.01	0.01
0140	42	.01	.01	.01
0145	49	.00	.01	.00
0150	48	.01	.00	.00
0155	49	.00	.00	.01
0200	49	.00	.01	.00
0205	48	.01	.00	.01
0210	42	.00	.00	.00
0215	37	.00	.01	.00
0220	34	.00	.00	.00
0225	32	.00	.00	.00
0230	30	.00	.00	.00
0235	28	.00	.00	.00
0240	24	.00	.00	.00
0245	21	.01	.00	.00
0250	19	.00	.00	.00
0255	16	.00	.00	.00
0300	14	.00	.00	.00
0305	12	.00	.00	.00
0310	10	.00	.00	.00
0315	8.9	.00	.00	.00
0320	7.8	.00	.00	.00
0325	6.5	.00	.00	.00
0330	6.6	.00	.00	.00
0335	4.6	.00	.00	.00
0340	4.1	.00	.00	.00
0345	3.6	.00	.00	.00
0350	3.0	.00	.00	.00
0355	2.8	.00	.00	.00
0400	2.4	.00	.00	.00
0405	2.0	.00	.00	.00
0410	1.8	.00	.00	.00
0415	1.6	.00	.00	.00
0420	1.5	.00	.00	.00
0425	1.4	.00	.00	.00
0430	1.3	.00	.00	.00
0435	1.2	.00	.00	.00
0440	1.1	.00	.00	.00

Table 34.--*Rainfall-runoff data, June 6, 1977, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1440	0.13	0.02	0.01	0.01
1445	.13	.04	.01	.00
1450	.18	.02	.00	.01
1500	1.8	.00	.00	.00
1505	3.6	.00	.01	.00
1510	14	.00	.00	.01
1515	14	.00	.00	.00
1520	14	.00	.01	.00
1525	13	.00	.00	.00
1530	12	.00	.00	.00
1535	12	.00	.00	.01
1540	11	.00	.00	.00
1545	11	.00	.00	.00
1550	11	.01	.00	.01
1555	11	.00	.00	.00
1600	11	.00	.00	.00
1605	10	.01	.00	.00
1610	9.1	.00	.00	.00
1615	8.9	.00	.01	.00
1620	8.7	.00	.00	.00
1625	8.9	.00	.00	.01
1630	9.3	.00	.02	.09
1635	9.3	.00	.01	.00
1640	9.3	.01	.00	.00
1645	9.5	.00	.01	.00
1650	9.8	.00	.00	.00
1655	10	.00	.00	.00
1700	10	.00	.00	.00
1705	11	.00	.00	.01
1710	12	.00	.01	.00
1715	12	.00	.00	.00
1720	11	.00	.00	.01
1725	11	.00	.00	.00
1730	10	.00	.00	.00
1735	10	.00	.00	.00

Table 34.--Rainfall-runoff data, June 6, 1977, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1740	10	0.00	0.00	0.00
1745	12	.00	.00	.00
1750	14	.00	.00	.00
1755	15	.00	.00	.00
1800	15	.00	.00	.00
1805	15	.00	.00	.00
1810	13	.00	.00	.00
1815	12	.00	.00	.00
1820	10	.00	.00	.00
1825	8.9	.00	.00	.00
1830	7.6	.00	.00	.00
1835	6.3	.00	.00	.00
1840	5.3	.00	.00	.00
1845	4.3	.00	.00	.00
1850	3.7	.00	.00	.00
1855	3.1	.00	.00	.00
1900	2.8	.00	.00	.00
1905	2.4	.00	.00	.00
1910	2.0	.00	.00	.00
1915	1.8	.00	.00	.00
1920	1.5	.00	.00	.00
1925	1.3	.00	.00	.00
1930	1.2	.00	.00	.00
1935	1.1	.00	.00	.00

Table 35.--*Rainfall-runoff data, June 19, 1977, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
0435	0.08	0.00	0.00	0.01
0445	.08	.00	.01	.00
0455	.08	.01	.00	.01
0500	.08	.01	.01	.00
0510	.10	.01	.01	.00
0515	.18	.01	.00	.00
0520	.37	.00	.01	.00
0530	2.3	.01	.00	.01
0535	12	.00	.00	.00
0540	13	.00	.00	.00
0545	13	.01	.01	.01
0550	14	.00	.00	.00
0555	13	.00	.00	.00
0600	13	.00	.00	.00
0605	13	.00	.00	.00
0610	13	.00	.01	.01
0615	13	.01	.00	.00
0620	14	.00	.00	.01
0625	13	.00	.01	.00
0630	13	.00	.00	.00
0635	13	.00	.00	.00
0640	13	.00	.00	.00
0645	14	.01	.00	.00
0650	15	.00	.00	.04
0655	15	.00	.01	.02
0700	15	.01	.01	.01
0705	14	.01	.01	.00
0710	14	.01	.01	.01
0715	23	.01	.01	.00
0720	49	.01	.01	.00
0725	53	.00	.00	.00
0730	50	.01	.00	.01
0735	45	.00	.01	.00
0740	41	.00	.00	.00
0745	34	.01	.02	.01

Table 35.--*Rainfall-runoff data, June 19, 1977, for station 06714100 Thirty-sixth Street Storm Sewer at Denver--Continued*

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
0750	32	0.00	0.00	0.00
0755	30	.00	.01	.00
0800	30	.00	.00	.00
0805	30	.00	.00	.00
0810	31	.00	.00	.00
0815	30	.00	.00	.00
0820	28	.01	.00	.01
0825	24	.00	.01	.00
0830	21	.01	.00	.00
0835	19	.00	.00	.00
0840	17	.00	.00	.00
0845	16	.00	.01	.00
0850	15	.00	.00	.00
0855	15	.00	.00	.00
0900	16	.00	.00	.00
0905	16	.00	.00	.01
0910	15	.00	.00	.00
0915	13	.00	.00	.00
0920	12	.00	.00	.00
0925	10	.00	.00	.00
0930	9.1	.00	.00	.00
0935	8.0	.00	.00	.00
0940	6.7	.00	.00	.00
0945	5.7	.00	.00	.00
0950	4.9	.00	.00	.00
0955	4.2	.00	.00	.00
1000	3.7	.00	.00	.00
1005	3.2	.00	.00	.00
1010	2.8	.00	.00	.00
1015	2.4	.00	.00	.00
1020	2.1	.00	.00	.00
1100	.88	.00	.00	.00

Table 36.--*Rainfall-runoff data, July 5, 1977, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver*

[Rainfall is reported in amounts measured during specified time increments;
time increment is 5 minutes]

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1700	0.49	0.00	0.00	0.01
1705	.52	.02	.02	.00
1710	.95	.01	.04	.01
1715	27	.09	.04	.07
1720	59	.09	.03	.02
1725	79	.02	.01	.02
1730	168	.00	.01	.01
1735	183	.00	.00	.00
1740	183	.01	.01	.00
1745	139	.00	.00	.00
1750	103	.00	.00	.00
1755	68	.00	.00	.00
1800	51	.00	.00	.00
1805	36	.00	.00	.00
1810	28	.00	.00	.00
1815	23	.00	.00	.00
1820	18	.00	.00	.00
1825	15	.00	.00	.00
1830	13	.00	.00	.00
1835	11	.00	.00	.00
1840	8.7	.00	.00	.00
1845	7.2	.00	.00	.00
1850	6.1	.00	.00	.00
1855	4.9	.00	.00	.00
1900	4.1	.00	.00	.00
1905	3.5	.00	.00	.00
1910	3.0	.00	.00	.00
1915	2.6	.02	.02	.02
1920	2.5	.03	.03	.08
1925	13	.06	.06	.05
1930	28	.03	.02	.03
1935	59	.02	.01	.02
1940	160	.01	.02	.04
1945	170	.03	.00	.02
1950	153	.01	.01	.01

Table 36.--Rainfall-runoff data, July 5, 1977, for
station 06714100 Thirty-sixth Street Storm Sewer at Denver--Continued

Time	Discharge, in ft ³ /s	Rainfall, in inches		
		Gage 1	Gage 2	Gage 3
1955	138	0.01	0.00	0.01
2000	127	.00	.01	.02
2005	123	.01	.01	.01
2010	111	.01	.01	.00
2015	83	.01	.00	.00
2020	66	.01	.00	.00
2025	70	.00	.00	.00
2030	64	.01	.01	.01
2035	59	.00	.00	.00
2040	45	.01	.00	.00
2045	36	.00	.01	.00
2050	34	.00	.00	.00
2055	29	.00	.00	.00
2100	26	.00	.00	.00
2105	23	.00	.00	.00
2110	20	.00	.00	.00
2115	18	.00	.00	.00
2120	15	.00	.00	.00
2125	13	.00	.00	.00
2130	12	.00	.00	.00
2135	10	.00	.00	.00
2140	8.9	.00	.00	.00
2145	7.6	.00	.00	.00
2150	6.5	.00	.00	.00
2155	5.6	.00	.00	.00
2200	4.8	.00	.00	.00
2205	4.1	.00	.00	.00
2210	3.6	.00	.00	.00
2215	3.1	.00	.00	.00
2220	2.9	.00	.00	.00
2225	2.5	.00	.00	.00
2230	2.3	.00	.00	.00
2320	.88	.00	.00	.00

WATER-QUALITY DATA

Miscellaneous Samples

Miscellaneous samples were collected manually for chemical analysis prior to February 1976, as described in the "Approach" section of this report. Results of the chemical analyses for the Littleton catchment area are presented in table 37, for the Lakewood catchment area in table 38, and for the Denver catchment area in table 39.

Samples of Runoff from Snowmelt and Rainfall

After installation of the automated water-quality sampling monitors in February 1976, samples of runoff for chemical analysis were collected for selected runoff periods. Sample collection usually started when runoff at the monitor sites began and continued until runoff ceased or approached base flow. Samples collected during March 1976 and from January through March 1977 are from snowmelt runoff; all other samples are from rainfall runoff.

TABLE 37.--MISCELLANEOUS WATER-QUALITY DATA FOR STATION
06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON

[> indicates greater than]

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1975 TO DECEMBER 1975

DATE	TIME	TEMPER- ATURE (DEG C)	INSTAN- TANEOUS DTS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICHO- MHOS)	PH (UNITS)	CARBON DIOXIDE (CO2) (MG/L)	ALKA- LINITY AS CACO3 (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	TOTAL NON- FILT- RAHLE RESIDUE (MG/L)	VOL. NON- FILT- RAHLE RESIDUE (MG/L)
MAY											
22...	2100	8.0	15	60	8.4	.2	30	37	0	--	--
28...	1300	10.0	1.0	190	7.1	--	--	--	--	100	36
29...	1125	5.0	34	<50	6.7	--	--	--	--	290	56
JUN											
08...	0020	16.5	20	65	7.1	--	--	--	--	369	74
10...	0910	4.0	5.0	80	6.8	--	--	--	--	58	8
10...	1300	10.5	3.0	105	7.0	--	--	--	--	72	18
10...	1310	--	--	--	--	--	--	--	--	--	--
AUG											
13...	0500	17.5	20	110	--	--	--	--	--	42	10
13...	0600	--	--	--	--	--	--	--	--	--	--
13...	0900	18.0	3.0	300	--	--	--	--	--	44	18
14...	1655	22.0	20	70	--	--	--	--	--	218	32
14...	1715	22.0	3.0	130	--	--	--	--	--	300	48
SEP											
11...	0840	14.5	1.0	185	--	--	--	--	--	58	18
OCT											
23...	1351	3.5	2.0	60	--	--	--	--	--	70	4
NOV											
09...	1310	1.0	6.0	<50	--	--	--	--	--	72	2

DATE	TOTAL NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHATE (PO4) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L)
MAY											
22...	--	--	--	--	--	--	--	.25	.49	--	.16
28...	3.9	1.9	.92	.15	.95	2.8	1.1	--	--	.24	--
29...	1.8	1.4	.10	.01	.32	1.5	.33	--	--	.09	--
JUN											
08...	2.6	2.1	.20	.02	.23	2.3	.25	--	--	.23	--
10...	1.0	.75	.08	.01	.15	.84	.16	--	--	.40	--
10...	.86	.47	.10	.02	.27	.57	.29	--	--	.47	--
10...	--	--	--	--	--	--	--	--	--	--	--
AUG											
13...	1.4	.75	.13	.06	.45	.88	.51	--	--	.71	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	1.9	.01	.11	.18	1.6	.12	1.8	--	--	.81	--
14...	2.2	1.1	.27	.05	.73	1.4	.78	--	--	.10	--
14...	2.4	1.5	.10	.07	.77	1.6	.84	--	--	.10	--
SEP											
11...	3.3	1.1	.87	.10	1.2	2.0	1.3	--	--	.28	--
OCT											
23...	2.2	1.8	.14	.03	.22	1.9	.25	--	--	.20	--
NOV											
09...	1.4	1.2	.09	.02	.12	1.3	.14	--	--	.11	--

TABLE 37.--MISCELLANEOUS WATER-QUALITY DATA FOR STATION
06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1975 TO DECEMBER 1975

DATE	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM ION (NA) (MG/L)	SODIUM AN- ION RATIO	PERCENT SODIUM	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)
MAY										
22...	--	--	31	0	11	.8	2.9	.2	16	2.3
28...	37	.5	--	--	31	--	17	--	--	--
29...	2.4	.2	--	--	3.5	--	1.8	--	--	--
JUN										
08...	8.0	3.9	--	--	5.9	--	2.1	--	--	--
10...	5.6	1.8	--	--	8.8	--	4.4	--	--	--
10...	7.9	3.4	--	--	14	--	5.5	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
AUG										
13...	--	--	--	--	13	--	5.4	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	33	--	18	--	--	--
14...	--	--	--	--	14	--	2.9	--	--	--
14...	--	--	--	--	14	--	6.5	--	--	--
SEP										
11...	--	--	--	--	21	--	7.0	--	--	--
OCT										
23...	11	1.9	--	--	7.2	--	4.7	--	--	--
NOV										
09...	5.5	.4	--	--	4.7	--	2.1	--	--	--

DATE	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- SULFATE (SO4) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)
MAY										
22...	2.5	4.8	.1	1.6	1	1	0	60	8	20
28...	13	48	--	--	--	--	--	--	--	--
29...	1.9	2.5	--	--	--	--	--	--	--	--
JUN										
08...	1.7	4.2	--	--	--	--	--	--	--	--
10...	1.9	7.9	--	--	--	--	--	--	--	--
10...	2.7	11	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
AUG										
13...	4.8	12	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	17	48	--	--	--	--	--	--	--	--
14...	2.3	9.0	--	--	--	--	--	--	--	--
14...	5.6	21	--	--	--	--	--	--	--	--
SEP										
11...	8.6	28	--	--	--	--	--	--	--	--
OCT										
23...	3.6	6.6	--	--	--	--	--	--	--	--
NOV										
09...	2.5	4.3	--	--	--	--	--	--	--	--

TABLE 37.--MISCELLANEOUS WATER-QUALITY DATA FOR STATION
06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1975 TO DECEMBER 1975

DATE	TIME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)	STREP- THOCOCT (COL- UNIT- PER 100 ML)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTIT- TUENTS) (MG/L)	DIS- SOLVED SOLIDS (TONS PER DAY)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	TOTAL ORTHOP- PHOS- PHORUS (P) (MG/L)	TOTAL NITRO- GEN (NO3) (MG/L)	DIS- SOLVED MERCURY (MG) (UG/L)
MAY										
22...	--	--	--	--	46	1.86	.06	--	--	.0
28...	5800	5000	--	182	--	.49	.25	.33	17	--
29...	3100	560	--	22	--	2.02	.03	.04	8.1	--
JUN										
08...	--	3300	--	42	--	2.27	.06	.15	11	--
10...	--	2500	49000	57	--	.77	.08	.21	4.4	--
10...	32000	3530	80000	77	--	.62	.10	.31	3.8	--
10...	--	3500	--	--	--	--	--	--	--	--
JUL										
13...	>200000	--	155000	85	--	4.59	.12	.57	6.2	--
13...	--	--	160000	--	--	--	--	--	--	--
13...	>200000	--	180000	216	--	1.75	.29	.69	8.5	--
14...	--	--	--	46	--	2.49	.06	.12	9.7	--
14...	--	--	--	83	--	.67	.11	.11	11	--
SEP										
11...	--	35000	110000	156	--	.42	.21	.29	15	--
OCT										
23...	--	--	--	59	--	.32	.08	.22	9.5	--
NOV										
09...	--	--	--	36	--	.59	.05	.10	6.4	--

TABLE 3B.--MISCELLANEOUS WATER-QUALITY DATA FOR STATION
06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1975 TO DECEMBER 1975

DATE	TIME	TEMPER- ATURE (°F/°C)	INSTAN- TANEOUS OIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHO/S)	PH (UNITS)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)
JUL										
09...	1935	18.0	<.10	460	6.5	269	112	10	6.7	.73
14...	1815	21.0	1.0	280	6.8	1450	228	17	17	.08
14...	1835	21.0	.50	185	7.0	1370	198	6.4	5.6	.08
16...	1830	17.5	1.5	160	7.3	1560	248	7.0	5.8	.13
30...	1450	22.0	4.0	470	--	164000	284	11	9.7	.04
30...	1505	23.0	2.0	155	--	164000	252	4.4	2.6	1.1
AUG										
13...	0410	16.0	6.0	75	--	676	72	.38	.22	.01
SEP										
10...	1535	21.0	10	140	--	1640	412	6.4	4.1	.59
10...	1600	21.0	2.0	130	--	935	120	4.4	2.2	.41
OCT										
23...	1500	4.0	.30	95	--	282	34	2.3	1.8	.20
NOV										
09...	1145	1.5	.30	120	--	550	44	2.3	1.9	.18

DATE	TOTAL NITRITE (N) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (MG/L)	OIS- SOL- VED- PHOS- PHORUS (P) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	OIS- SOLVED CAL- CIUM (CA) (MG/L)	OIS- SOLVED SODIUM (NA) (MG/L)	OIS- SOLVED CHLO- RIDE (CL) (MG/L)
JUL										
09...	2.6	.20	7.4	2.8	.18	--	--	60	29	15
14...	.19	.17	17	.36	.06	--	--	31	17	9.9
14...	.17	.54	5.7	.71	.11	--	--	24	11	4.5
16...	.14	.96	5.9	1.1	.07	--	--	17	15	8.0
30...	.38	.92	9.7	1.3	.03	--	--	50	32	19
30...	.40	.32	3.7	.72	.00	--	--	20	7.6	4.4
AUG										
13...	.04	.11	.23	.15	.12	--	--	8.6	6.9	4.0
SEP										
10...	.16	1.5	4.7	1.7	.07	--	--	16	5.8	4.2
10...	.17	1.6	2.6	1.8	.13	--	--	15	4.1	4.1
OCT										
23...	.08	.17	2.0	.25	.06	8.9	2.2	10	5.8	3.2
NOV										
09...	.08	.11	2.1	.19	.05	5.5	.6	7.7	14	12

DATE	DIS- SOLVED SULFATE (SO4) (MG/L)	TIME- OIAE- COLI- FORM (COL) PER 100 ML	FECAL COLI- FORM (COL) PER 100 ML	STREP- TOCOCCI (COL) ONIES PER 100 ML	OIS- SOLVED SOLIDS (RESI- DUE AT 140 C) (MG/L)	DIS- SOLVED SOLIDS (TONS PER DAY)	OIS- SOLVED SOLIDS (TONS PER AC-FT)	TOTAL ORTHO- PHOS- PHORUS (P) (MG/L)	TOTAL NITRO- GEN (NO3) (MG/L)
JUL									
09...	66	--	3400	51000	456	.12	.62	.18	45
14...	33	--	15000	42000	263	.71	.36	.17	77
14...	19	--	14000	120000	169	.23	.23	.05	28
16...	18	25000	14000	--	142	.58	.19	.08	31
30...	52	49000	3000	3000	365	3.94	.50	.00	49
30...	13	--	4000	39000	159	.86	.22	.03	20
AUG									
13...	8.5	100000	--	79000	62	1.00	.04	.12	1.7
SEP									
10...	17	38000	3000	13000	129	3.48	.18	.13	28
10...	15	--	10000	34000	113	.61	.15	.30	19
OCT									
23...	10	--	--	--	72	.06	.10	.22	10
NOV									
09...	5.4	--	--	--	66	.05	.09	.22	10

TABLE 39.--MISCELLANEOUS WATER-QUALITY DATA FOR STATION
06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER

[> indicates greater than]

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1975 TO DECEMBER 1975

DATE	TIME	TEMPER- ATURE (DEG C)	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	CARBON DIOXIDE (CO2) (MG/L)	ALKA- LINITY AS CACO3 (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL- NON- FILT- RABLE RESIDUE (MG/L)
MAY											
22...	2230	9.0	--	59	6.9	2.8	11	14	0	--	--
28...	1440	12.0	20	110	7.0	--	--	--	--	174	62
29...	1230	--	40	<50	6.4	--	--	--	--	100	28
JUN											
07...	2305	15.5	40	320	6.6	--	--	--	--	642	272
08...	1610	21.0	35	50	7.1	--	--	--	--	402	112
10...	1020	9.0	30	<50	6.3	--	--	--	--	56	26
10...	1415	11.5	7.0	80	--	--	--	--	--	137	37
JUL											
24...	1700	22.0	10	150	--	--	--	--	--	416	110
24...	1730	21.5	3.0	190	--	--	--	--	--	356	102
AUG											
13...	0600	18.0	30	55	--	--	--	--	--	26	12
13...	1010	19.0	6.0	145	--	--	--	--	--	30	22
SEP											
11...	0940	15.5	15	165	--	--	--	--	--	164	42
OCT											
23...	1230	5.5	15	130	--	--	--	--	--	150	38
24...	1400	--	--	--	--	--	--	--	--	80	20
NOV											
09...	1410	5.0	20	95	--	--	--	--	--	70	18

DATE	TOTAL NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED ORTHOPHOS- PHATE (PO4) (P) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L)	DIS- SOLVED ORTHOPHOS- PHORUS (P) (MG/L)
MAY											
22...	--	--	--	--	--	--	--	.35	.49	--	.16
28...	3.5	2.3	.56	.09	.52	2.9	.61	--	--	.36	--
29...	1.7	1.3	.11	.04	.24	1.4	.28	--	--	.13	--
JUN											
07...	11	9.4	1.6	.01	.03	11	.04	--	--	.69	--
08...	4.6	4.0	.19	.03	.34	4.2	.37	--	--	.30	--
10...	.84	.21	.46	.02	.15	.67	.17	--	--	.03	--
10...	2.2	1.1	.65	.06	.41	1.7	.47	--	--	.25	--
JUL											
24...	7.9	7.9	.00	.01	.03	7.9	.04	--	--	.55	--
24...	6.7	6.7	.00	.01	.01	6.7	.02	--	--	.54	--
AUG											
13...	.60	.20	.05	.04	.31	.25	.35	--	--	.21	--
13...	1.6	.94	.06	.08	.56	1.0	.64	--	--	.00	--
SEP											
11...	7.5	4.0	2.4	.49	.61	6.4	1.1	--	--	.58	--
OCT											
23...	5.0	4.4	.17	.12	.28	4.6	.40	--	--	.47	--
24...	4.6	3.5	.31	.12	.68	3.8	.80	--	--	.73	--
NOV											
09...	2.8	2.4	.13	.03	.26	2.5	.29	--	--	.25	--

TABLE 39.--MISCELLANEOUS WATER-QUALITY DATA FOR STATION
06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1975 TO DECEMBER 1975

DATE	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	NON- CAL- CIUM HAZD- NESS (CA+MG) (MG/L)	NON- CAL- CIUM HAZD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	PERCENT SODIUM	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)
MAY										
22...	--	--	13	1	4.9	.1	2.9	.4	29	2.0
28...	26	4.3	--	--	11	--	7.3	--	--	--
29...	24	2.2	--	--	4.3	--	2.5	--	--	--
JUN										
07...	43	10	--	--	26	--	18	--	--	--
08...	22	9.0	--	--	7.2	--	3.2	--	--	--
10...	5.2	2.0	--	--	4.6	--	2.6	--	--	--
10...	14	1.1	--	--	8.4	--	5.4	--	--	--
JUL										
24...	--	--	--	--	20	--	12	--	--	--
24...	--	--	--	--	20	--	11	--	--	--
AUG										
13...	--	--	--	--	7.1	--	3.1	--	--	--
13...	--	--	--	--	14	--	11	--	--	--
SEP										
11...	--	--	--	--	16	--	7.7	--	--	--
OCT										
23...	1.8	5.3	--	--	10	--	5.8	--	--	--
24...	38	2.3	--	--	19	--	21	--	--	--
NOV										
09...	.9	.2	--	--	8.2	--	12	--	--	--

DATE	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)
MAY										
22...	2.6	7.0	.2	.9	2	1	10	70	12	30
28...	7.8	11	--	--	--	--	--	--	--	--
29...	2.8	4.3	--	--	--	--	--	--	--	--
JUN										
07...	18	35	--	--	--	--	--	--	--	--
08...	2.7	7.2	--	--	--	--	--	--	--	--
10...	1.4	5.9	--	--	--	--	--	--	--	--
10...	3.5	14	--	--	--	--	--	--	--	--
JUL										
24...	12	25	--	--	--	--	--	--	--	--
24...	14	22	--	--	--	--	--	--	--	--
AUG										
13...	3.2	8.5	--	--	--	--	--	--	--	--
13...	9.7	24	--	--	--	--	--	--	--	--
SEP										
11...	8.8	23	--	--	--	--	--	--	--	--
OCT										
23...	8.6	11	--	--	--	--	--	--	--	--
24...	29	23	--	--	--	--	--	--	--	--
NOV										
09...	13	6.6	--	--	--	--	--	--	--	--

TABLE 39.--MISCELLANEOUS WATER-QUALITY DATA FOR STATION
06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1975 TO DECEMBER 1975

DATE	IMMF- DIATF COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)	ST-EP- TODOCOCI (COL- UNITES PER 100 ML)	DIS- SOLVED SOLIDS (REST- DIF AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	DIS- SOLVED SOLIDS (TONS PER DAY)	DIS- SOLVED SOLIDS (TONS PER AC-FT)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL NITRO- GEN (NO3) (MG/L)	DIS- SOLVED MERCURY (MG) (UG/L)
MAY										
22...	--	--	--	--	30	--	.04	--	--	.0
28...	--	140000	--	82	--	4.43	.11	.33	16	--
29...	14400	5700	--	28	--	3.02	.04	.11	7.4	--
JUN										
07...	>200000	5200	--	311	--	33.6	.42	.30	49	--
08...	>110000	11000	--	54	--	5.10	.07	.10	20	--
10...	>110000	14000	105000	28	--	2.27	.04	.09	3.7	--
10...	--	17000	110000	58	--	1.10	.08	.21	9.6	--
JUL										
24...	>200000	>100000	--	150	--	4.05	.20	1.9	35	--
24...	> 00000	>100000	--	185	--	1.50	.25	.09	30	--
AUG										
13...	89000	--	57000	42	--	3.40	.06	.11	2.7	--
13...	0000	--	200000	103	--	1.67	.14	.27	7.3	--
SEP										
11...	00000	290000	276000	131	--	5.31	.18	.29	33	--
OCT										
23...	--	--	--	108	--	4.37	.15	.40	22	--
24...	--	--	--	167	--	--	.23	.29	20	--
NOV										
09...	--	--	--	60	--	3.24	.08	.15	12	--

Major Constituents

Samples were analyzed for the following major constituents and parameters: specific conductance, pH, hardness, noncarbonate hardness, alkalinity, sodium-adsorption ratio, silica, calcium, magnesium, sodium, potassium, manganese, bicarbonate, carbonate, sulfate, chloride, and fluoride.

Results of the analyses from the Littleton catchment area are presented in table 40, for the Lakewood catchment area in table 41, and for the Denver catchment area in table 42.

TABLE 40.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON

[E indicates estimated]

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTANTANEOUS DTS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MOS)	PH (UNITS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLOR- IDE (CL) (MG/L)
MAR								
06...	1135	F.20	2150	7.1	140	280	280	440
06...	1235	F.50	1090	7.4	17	190	29	320
06...	1335	F.30	750	7.5	11	130	16	250
06...	1435	E.20	580	7.6	9.3	97	13	160
06...	1535	F.10	480	7.6	9.1	82	14	130
29...	0925	F.30	120	8.1	7.0	8.3	6.6	14
29...	0935	F.50	100	8.3	6.4	10	5.2	6.3
29...	0945	F.30	85	7.8	6.5	11	5.4	6.5
29...	0955	E.20	80	7.8	7.2	7.3	5.4	6.4
APR								
29...	2200	E14	70	9.0	6.3	3.9	6.4	2.3
29...	2205	E13	65	8.6	5.9	3.9	5.5	1.9
29...	2210	E12	70	8.6	5.9	4.7	6.3	2.6
29...	2215	E10	65	8.5	6.1	4.9	6.1	2.1
29...	2220	E9.1	70	8.4	6.2	3.8	6.7	2.8
29...	2225	E4.1	70	7.4	6.2	3.8	6.5	2.0
29...	2230	F7.7	90	7.7	6.8	4.0	6.4	2.9
29...	2235	F7.7	90	7.7	8.2	4.6	7.3	3.5
29...	2240	F7.8	90	7.6	8.6	4.4	7.5	2.6
29...	2245	F7.4	90	7.5	8.4	6.1	7.3	2.6
29...	2255	E7.1	90	7.7	8.6	4.7	7.7	2.9
29...	2300	F6.8	90	7.7	8.7	4.8	8.0	2.9
29...	2310	E6.5	90	7.9	9.2	8.6	7.9	2.9
29...	2315	F6.0	95	7.8	9.0	5.1	8.2	2.9
29...	2320	E5.2	100	7.8	9.8	5.2	9.4	3.1
29...	2325	E4.4	100	7.7	9.4	7.0	8.8	3.7
29...	2330	E3.9	100	7.9	9.9	5.6	9.7	4.4
29...	2335	E3.3	95	7.8	10	5.6	11	4.4
29...	2345	E3.8	120	7.5	11	6.8	11	4.2
29...	2350	E4.4	120	7.4	12	7.9	12	3.7
29...	2355	E5.1	120	7.4	12	8.2	12	4.0
MAY								
25...	1754	--	170	7.3	18	8.8	24	9.7
30...	1350	49	140	7.6	14	7.0	10	4.4
30...	1355	60	100	7.5	15	7.0	18	9.6
30...	1400	63	95	7.5	8.9	5.0	8.6	4.1
30...	1405	54	83	7.5	8.1	3.0	8.9	3.3
30...	1410	38	80	7.5	8.4	4.2	7.6	3.1
30...	1415	19	90	7.5	8.5	3.6	9.8	3.3
30...	1420	F12	105	7.5	9.3	5.9	11	3.5
30...	1425	E7.0	120	7.5	11	6.7	13	4.2

TABLE 40.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED MAGNE- SULFATE (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
MAY									
30...	1430	F4.0	160	7.5	17	7.0	--	19	7.2
30...	1435	F3.0	180	7.6	19	7.5	--	20	8.1
30...	1440	F2.0	180	7.6	18	7.9	--	20	7.7
30...	1445	F1.0	180	7.6	20	10	--	20	7.7
30...	1450	F1.0	195	7.6	20	9.0	--	22	8.1
30...	1455	F.50	205	7.6	21	10	--	23	8.4
30...	1500	F.20	200	7.6	24	9.4	--	24	8.8
JUL									
19...	1840	10	210	7.4	--	--	170	--	--
25...	1745	30	270	7.2	24	19	--	40	26
25...	1750	52	170	7.2	11	7.9	--	13	7.0
25...	1754	65	105	7.3	9.9	3.9	--	11	5.7
25...	1804	46	95	7.4	10	4.3	--	9.5	4.0
25...	1820	F4.0	160	7.3	18	7.9	--	23	9.0
25...	1832	F1.0	210	7.3	22	14	--	38	14
25...	1836	F.50	220	7.2	23	9.0	--	40	15
25...	1840	F.20	200	7.5	20	12	--	33	13
25...	1844	F.20	170	7.4	18	7.4	--	22	9.7
25...	1854	F.20	160	7.5	17	7.0	--	20	9.3
25...	1902	F.20	255	7.3	17	10	--	22	9.3
25...	1905	F.20	170	7.5	18	7.8	--	22	9.7
25...	1910	F.20	170	7.4	20	12	--	24	11
25...	1924	F.20	200	7.6	21	10	--	30	12
25...	1924	F.20	205	7.4	21	11	--	32	12
25...	1932	F.20	210	7.3	22	11	--	33	13
25...	1936	F.20	235	7.3	25	14	--	39	13
25...	1948	F.20	240	7.3	26	12	--	40	14
25...	1952	F.20	250	7.6	28	16	--	40	14
25...	2006	F.20	255	7.5	28	17	--	40	14
25...	2018	F.20	255	7.5	29	13	--	40	14
25...	2022	F.20	255	7.6	29	14	--	43	14
25...	2026	F.20	225	7.5	25	11	--	35	12
AUG									
01...	0214	F3.3	255	7.6	26	17	--	34	20
01...	0225	F14	110	7.6	12	4.8	--	11	5.3
01...	0230	F17	100	7.5	11	3.8	--	9.5	4.0
01...	0234	F17	80	7.8	10	7.9	--	9.1	3.5
01...	0234	F18	85	7.7	9.5	3.5	--	8.3	3.7
01...	0242	F19	70	7.8	8.3	3.3	--	7.5	3.5
01...	0246	F20	70	7.7	7.2	2.7	--	6.5	2.7
01...	0250	F24	60	7.9	6.7	2.6	--	6.0	2.3

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
AUG								
01...	0304	E29	50	7.9	5.4	5.4	5.2	1.6
01...	0318	E21	55	8.1	5.7	1.9	5.5	1.8
01...	0330	E15	70	8.0	7.7	7.2	7.8	2.7
01...	0334	F14	75	7.8	8.0	7.2	8.7	3.0
01...	0338	E12	80	8.0	8.2	3.4	9.6	3.2
SEP								
25...	0804	F5.0	65	7.8	22	11	7.6	2.7
27...	1130	.10	300	7.8	42	19	52	13

TABLE 40.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	TIME	INSTAN- TANEOUS DISE- CHANGE (CF5)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	ALKA- LITY AS CACO3 (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)
APR										
18...	1525	3.3	320	7.7	42	37	55	1.1	3.0	31
18...	1535	3.2	205	7.5	56	28	28	.9	2.1	19
18...	1545	2.5	200	7.5	56	28	28	.8	2.1	19
18...	1555	2.0	180	7.4	52	22	30	.8	2.2	18
18...	1605	1.9	180	7.5	50	20	30	.7	2.3	17
18...	1615	1.7	186	7.5	53	23	30	.8	2.4	18
18...	1625	1.5	200	7.5	56	23	33	.9	2.7	19
JUN										
11...	1515	30	146	6.5	45	6	39	.4	2.4	16
11...	1520	48	110	6.5	31	1	30	.4	1.8	11
11...	1525	51	104	6.6	34	6	28	.3	1.9	12
11...	1530	81	88	6.7	29	0	29	.3	1.5	9.9
11...	1535	91	103	6.8	43	10	33	.2	1.5	16
11...	1540	96	80	6.7	26	0	25	.3	1.3	9.2
11...	1545	90	80	6.7	28	4	25	.3	1.4	10
11...	1550	76	78	6.7	25	3	21	.3	1.5	8.7
11...	1555	50	79	6.7	25	5	19	.3	1.5	8.5
11...	1605	44	93	6.8	31	6	25	.3	2.0	11
11...	1610	29	110	6.7	35	7	29	.3	2.3	12
11...	1615	21	120	6.8	38	8	30	.3	2.3	13
11...	1620	12	128	7.0	41	12	30	.4	2.6	14
11...	1625	9.1	144	6.8	44	11	34	.4	2.9	15
11...	1630	7.0	160	7.0	53	18	34	.5	3.1	18
11...	1635	5.5	140	7.0	--	--	37	--	3.2	--
11...	1640	5.0	150	7.0	59	21	39	.5	3.4	20
11...	1645	4.6	179	7.0	60	20	40	.5	3.3	20
11...	1650	.1	189	6.9	60	19	41	.5	3.5	20
11...	1655	4.0	198	7.0	60	19	41	.5	3.8	20
11...	1700	3.9	180	7.0	73	32	41	.5	3.8	25
11...	1705	3.5	200	7.1	68	26	42	.5	3.9	23
11...	1710	3.4	195	7.2	66	21	44	.5	4.0	22

DATE	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED POT- TAS- SIUM (K) (MG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED CHLOR- IDE (CL) (MG/L)	DIS- SOLVED FLUOR- IDE (F) (MG/L)
APR								
18...	3.5	24	5.5	60	67	0	65	19
18...	2.1	15	4.3	50	34	0	35	11
18...	2.0	14	4.0	50	34	0	34	11
18...	1.7	13	3.9	40	36	0	29	9.7
18...	1.8	12	3.7	40	36	0	28	9.3
18...	1.9	13	3.6	60	36	0	30	9.6
18...	2.1	15	3.8	60	40	0	35	11
JUN								
11...	1.3	6.2	4.0	70	48	--	18	5.1
11...	.9	4.4	3.7	30	37	--	12	3.7
11...	.9	4.0	3.6	10	34	--	5.6	3.5
11...	1.0	3.7	3.1	20	35	--	9.1	3.6
11...	.8	3.0	3.0	10	40	--	8.5	2.9
11...	.7	3.3	2.9	0	31	--	6.7	2.9
11...	.8	3.2	2.6	0	30	--	6.5	2.6
11...	.7	3.6	2.4	0	26	--	7.4	2.4
11...	.9	2.9	2.5	0	23	--	10	2.7
11...	.9	3.8	3.2	0	31	--	10	3.5
11...	1.3	4.2	3.5	0	35	--	12	4.3
11...	1.3	4.4	3.5	0	36	--	14	4.6
11...	1.5	6.5	3.5	0	36	--	16	5.0
11...	1.7	6.0	4.0	0	41	--	19	5.6
11...	1.9	8.2	4.0	0	42	--	22	7.7
11...	--	--	--	--	45	--	26	8.2
11...	2.3	9.4	4.2	10	47	--	27	7.9
11...	2.5	9.4	4.5	0	49	--	28	7.9
11...	2.4	9.5	4.5	0	50	--	28	8.1
11...	2.5	9.4	4.5	10	50	--	29	8.0
11...	2.5	9.0	4.5	10	50	--	30	7.8
11...	2.5	9.6	4.6	0	51	--	29	7.9
11...	2.6	9.6	4.6	10	54	--	30	8.2

TABLE 41.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD

[E indicates estimated]

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTAN- TANEOUS DTS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
MAR								
03...	1145	F.10	1900	7.9	22	310	22	540
06...	1230	F.10	1650	8.1	24	300	23	490
29...	0940	F.15	700	8.6	12	110	8.3	170
29...	1030	F.10	550	8.7	10	95	9.4	130
29...	1130	F.05	360	8.5	8.7	61	8.7	79
29...	1230	F.03	720	8.5	19	120	12	190
29...	1400	F.03	650	8.5	15	110	13	150
JUN								
17...	1328	F3.0	170	8.4	9.8	22	21	15
17...	1330	F5.3	130	8.4	8.7	19	16	11
17...	1332	F3.5	110	8.6	7.5	18	13	7.2
17...	1335	F2.0	115	8.6	7.7	21	11	4.9
17...	1340	F5.5	110	8.4	9.7	18	12	7.2
17...	1350	F3.2	110	8.4	7.8	15	12	7.9
17...	1400	F2.0	120	8.1	9.1	17	13	7.6
JUL								
19...	1820	E4.6	135	8.5	8.6	7.9	8.7	5.7
19...	1822	F5.2	140	8.4	9.3	11	8.7	3.7
19...	1824	F6.0	145	8.4	11	6.4	8.5	3.8
19...	1826	E6.2	145	8.4	10	6.3	9.4	5.1
19...	1828	F5.8	145	8.4	10	6.5	9.0	3.0
19...	1830	F3.7	145	8.4	11	6.2	9.0	3.0
19...	1832	E4.6	145	8.3	8.9	10	8.9	3.2
19...	1834	E4.0	145	8.3	9.4	13	8.8	3.2
19...	1835	E3.7	145	8.3	9.3	6.2	8.7	3.2
19...	1838	E3.3	145	8.3	9.5	10	8.8	3.4
19...	1840	E3.0	140	8.3	9.6	10	8.7	3.5
19...	1842	E2.8	140	8.3	9.4	6.3	8.9	3.8
19...	1844	E2.6	140	8.3	10	6.3	8.9	3.7
19...	1846	E2.4	140	8.3	9.9	6.2	8.9	3.8
19...	1848	E2.2	140	8.3	10	11	9.0	3.8
19...	1850	E2.1	140	8.2	10	6.3	9.0	3.6
19...	1852	E2.0	140	8.3	9.5	6.0	9.1	3.6
19...	1854	E1.8	140	8.2	10	6.4	9.3	5.5
19...	1856	F1.6	140	8.2	9.7	6.5	9.5	5.7
19...	1858	F1.5	140	8.2	9.7	6.5	9.6	5.8
19...	1900	E1.4	145	8.2	9.5	6.4	9.8	6.2
19...	1902	E1.3	145	8.2	9.9	6.4	10	3.2
19...	1904	E1.2	145	8.1	10	6.5	9.9	3.5
19...	1906	E1.2	150	8.1	9.6	10	9.9	3.6
SEP								
14...	1442	F5.5	123	8.9	12	9.1	10	2.7

TABLE 41.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD--CONTINUED

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHO/S)	PH (UNITS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
SEP								
14...	1444	E5.0	130	8.9	12	8.3	14	3.0
14...	1446	F4.5	175	8.8	15	9.9	24	5.7
14...	1450	E3.8	190	8.8	15	10	25	6.4
14...	1454	E3.0	185	8.8	15	9.9	26	5.5
14...	1458	E2.7	190	8.7	16	9.9	27	5.9
14...	1500	F2.5	210	8.5	17	8.9	32	6.7
14...	1504	E2.3	225	9.5	18	11	46	7.8
14...	1510	E1.9	240	8.4	19	9.4	46	8.8
14...	1520	E1.2	260	8.2	19	10	49	9.2
27...	1055	F.50	290	7.9	27	20	33	14
OCT								
06...	1030	F.10	320	7.9	33	20	45	19
06...	1057	E2.5	180	8.5	19	12	23	8.1
06...	1129	F3.2	80	8.9	8.6	5.0	7.8	3.4
06...	1225	E2.1	105	8.7	11	7.3	10	5.7
06...	1258	E1.4	91	8.7	9.4	5.7	8.4	3.8
06...	1343	E3.4	140	8.3	15	11	16	6.9
06...	1417	E2.8	180	7.9	18	14	23	7.8

TABLE 41.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHS)	PH (UNITS)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	ALKA- LITY AS CaCO3 (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)
FER										
14...	1005	E3.0	2140	7.2	69	36	33	20	2.4	23
14...	1015	E5.0	1790	7.0	62	29	34	18	2.1	21
14...	1030	E7.0	2100	7.0	91	52	30	14	2.0	27
14...	1100	E4.0	1850	7.1	64	35	29	17	1.9	21
14...	1120	E8.0	1480	7.1	52	22	30	16	1.9	17
14...	1130	E10	1380	7.2	49	19	30	16	1.9	16
14...	1140	E4.0	1310	7.3	43	12	31	15	2.0	14
14...	1150	E6.0	1260	7.4	43	12	31	14	2.1	14
14...	1200	E5.0	1200	7.4	43	11	32	13	2.2	14
14...	1215	E4.0	1110	7.4	39	4	35	14	2.4	13
14...	1230	E3.0	1060	7.6	39	3	36	12	2.4	13
14...	1300	E1.0	1000	7.4	42	3	39	11	2.4	14
14...	1400	E.50	978	7.6	42	2	40	11	2.5	14
APR										
19...	1410	1.0	180	8.1	44	0	54	1.3	3.5	15
19...	1415	1.3	165	8.0	38	0	48	1.1	3.1	13
19...	1425	1.5	135	8.1	30	0	48	1.2	3.0	10
19...	1435	1.7	110	8.3	27	0	44	1.0	2.9	9.0
19...	1445	2.0	85	8.3	22	0	38	.8	2.4	7.6
19...	1455	2.3	90	8.2	22	0	41	.9	2.5	7.3
19...	1505	3.1	100	8.4	21	0	39	.7	2.2	7.2
19...	1520	2.8	105	8.5	20	0	37	.8	2.2	6.7
19...	1535	3.3	105	8.5	20	0	35	.8	2.1	6.5
19...	1550	2.7	125	8.5	24	0	39	1.2	2.7	7.5
19...	1605	2.6	120	8.4	23	0	38	1.1	2.7	7.5
19...	1620	2.6	120	8.6	24	0	40	1.1	2.8	8.0
19...	1635	2.6	125	8.5	20	0	37	1.1	2.6	6.2
19...	1650	2.3	120	8.6	23	0	38	1.0	2.9	7.7
19...	1705	2.5	113	8.6	24	0	34	1.0	2.7	7.9
19...	1720	2.0	110	8.4	25	0	36	1.0	2.9	8.3
19...	1735	1.7	110	8.4	26	0	35	1.2	2.9	8.6
19...	1750	1.6	110	8.3	27	0	37	1.2	3.0	8.9
19...	1805	1.9	110	8.3	27	0	37	1.1	2.9	8.9
19...	1820	2.5	105	8.3	25	0	34	1.0	2.7	8.2
19...	1835	2.9	170	8.1	44	0	45	1.5	3.5	14
19...	1850	3.3	110	8.3	26	0	37	1.0	2.9	8.6

TABLE 41.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	DIS- SOLVED MAG- NE- SIUM (MG/L)	DIS- SOLVED TAS- SIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	DIS- SOLVED MAN- GANESE (MN) (MG/L)	ACAR- RONATE (HCO3) (MG/L)	CAY- RONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- WIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)
FEH									
14...	2.7	380	4.1	200	40	--	27	610	.4
14...	2.4	320	3.4	150	41	--	21	500	.3
14...	3.4	370	3.7	170	36	--	22	610	.3
14...	2.9	320	3.2	120	35	--	21	530	.3
14...	2.3	260	2.8	100	37	--	20	420	.3
14...	2.2	250	2.6	80	36	--	19	390	.3
14...	1.9	220	2.3	80	38	--	19	350	.3
14...	2.0	210	2.6	70	38	--	19	330	.4
14...	1.9	200	2.3	60	39	--	19	310	.4
14...	1.7	200	2.4	60	43	--	19	310	.4
14...	1.7	190	2.2	60	44	--	18	280	.4
14...	1.7	170	2.3	70	48	--	18	260	.3
14...	1.8	160	2.2	50	49	--	18	240	.4
APR									
19...	1.6	20	2.7	120	66	0	21	18	.3
19...	1.3	16	2.4	70	59	0	17	14	.3
19...	1.2	15	1.8	50	58	0	13	11	.3
19...	1.0	12	1.6	40	54	0	11	8.9	.2
19...	.8	8.9	1.4	30	46	0	10	6.0	.2
19...	.8	9.2	1.3	30	50	0	4.1	6.1	.2
19...	.7	7.0	1.2	20	47	0	7.3	4.8	.2
19...	.8	7.8	1.0	10	45	0	7.0	4.6	.2
19...	.8	7.8	1.1	0	43	0	6.2	5.0	.1
19...	1.1	13	1.2	10	47	0	7.9	9.6	.2
19...	1.0	12	1.2	30	46	0	6.5	10	.2
19...	1.0	12	1.2	0	49	0	6.5	9.4	.2
19...	1.0	11	1.2	0	45	0	6.5	8.7	.1
19...	1.0	11	1.2	10	46	0	7.0	9.2	.1
19...	1.0	11	1.1	20	41	0	6.8	8.4	.1
19...	1.1	12	1.3	20	44	0	7.8	9.2	.1
19...	1.2	14	1.5	20	43	0	8.6	11	.1
19...	1.2	14	1.3	0	45	0	8.3	10	.2
19...	1.1	13	1.3	0	45	0	8.3	10	.2
19...	1.0	11	1.1	10	42	0	7.3	8.1	.2
19...	2.1	23	1.5	20	55	0	12	25	.2
19...	1.2	12	1.1	0	45	0	8.3	8.8	.2

TABLE 42.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER

[E indicates estimated]

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
MAR								
05...	1320	13	8000	7.9	67	1900	73	3300
05...	1400	15	7600	7.6	57	1600	64	2700
05...	1415	14	6100	7.6	53	1500	59	2500
05...	1530	18	6000	7.5	43	1100	49	1900
05...	1630	13	5600	7.5	42	940	37	1600
05...	1700	4.0	5000	7.5	42	880	36	1600
05...	1100	1.1	2000	7.1	32	280	55	470
06...	1145	5.1	2300	7.1	36	530	44	490
06...	1230	21	2800	6.8	30	460	36	420
06...	1300	25	2300	7.5	26	400	32	710
06...	1400	30	1800	7.5	24	310	28	550
06...	1500	24	1500	7.5	21	260	25	440
06...	1600	14	1400	7.6	22	240	24	370
26...	1020	1.6	280	7.8	18	25	34	34
26...	1030	1.9	280	7.8	17	23	31	26
26...	1040	2.3	280	7.8	17	24	30	27
26...	1050	2.7	220	7.8	13	17	25	19
26...	1100	3.1	200	7.6	12	14	23	16
26...	1110	3.7	220	7.6	17	16	34	16
26...	1120	5.9	220	7.6	13	15	26	16
26...	1130	9.2	210	7.5	13	18	27	16
26...	1330	5.1	210	7.8	16	18	30	18
26...	1400	1.6	220	7.9	15	21	29	20
26...	1430	.90	210	7.8	18	22	33	23
26...	1530	.30	330	8.0	23	27	42	24
27...	1045	.22	500	7.7	16	78	19	120
28...	1600	.22	350	7.9	15	46	30	53
28...	1610	.23	280	7.5	11	36	22	44
28...	1620	.23	280	7.3	8.9	40	17	53
28...	1630	.22	260	7.4	7.9	48	11	72
28...	1640	31	250	7.3	6.9	37	11	52
28...	1650	37	140	7.3	5.5	23	9.7	24
28...	1700	42	110	7.5	5.5	17	9.2	22
28...	1710	38	160	7.4	5.5	21	9.4	27
28...	1720	36	140	7.3	5.5	17	10	20
29...	1100	7.2	440	7.9	14	68	19	98
29...	1115	8.9	360	7.7	13	54	19	77
29...	1145	9.8	190	7.6	11	19	19	24
29...	1200	9.8	280	7.4	14	40	19	56

TABLE 42.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTANTANEOUS CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MOS)	PH (UNITS)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
MAR								
23...	1215	9.9	240	7.5	12	31	14	44
24...	1245	9.5	320	7.6	12	42	18	57
29...	1330	9.5	200	7.6	11	25	17	36
29...	1430	7.2	140	7.4	10	16	16	19
29...	1500	1.8	200	8.4	11	22	18	22
29...	1530	1.3	210	7.9	12	23	19	23
29...	1600	.95	170	7.2	11	17	18	22
29...	1630	.77	190	7.6	12	23	19	24
29...	1700	.62	170	7.5	11	18	21	20
APR								
27...	2320	4.0	50	8.0	4.7	4.0	6.3	3.2
29...	2200	3.1	395	7.9	25	35	51	38
29...	2210	4.9	205	7.8	15	21	29	21
29...	2220	14	159	7.9	12	20	23	14
29...	2230	29	117	7.8	8.7	13	15	9.0
29...	2240	42	115	7.8	6.8	9.9	11	6.9
29...	2250	F55	81	7.9	5.8	5.5	8.5	4.8
29...	2300	F65	75	8.0	5.4	4.6	7.5	3.7
29...	2310	F70	58	8.0	5.0	4.2	6.9	3.3
29...	2330	E50	69	8.1	4.7	4.7	9.2	4.1
29...	2340	E50	59	8.0	4.4	4.3	6.2	3.8
29...	2350	42	95	8.0	6.9	6.9	9.7	5.3
29...	2400	33	71	8.1	4.7	4.4	6.1	3.4
29...	0020	21	70	7.4	5.2	4.7	6.7	4.7
30...	0030	18	70	7.8	5.5	4.1	6.9	4.2
30...	0040	15	80	7.6	5.8	5.3	7.1	5.3
30...	0050	12	85	7.6	6.3	8.5	9.1	5.2
30...	0100	10	90	7.6	6.5	5.6	9.8	4.9
30...	0110	9.0	90	7.5	6.8	8.8	10	8.0
30...	0120	9.0	60	7.7	4.9	4.0	6.7	5.4
30...	0130	5.9	100	7.8	7.6	6.6	11	6.1
30...	0140	5.1	100	7.7	7.7	6.9	10	7.3
30...	0150	4.3	120	7.9	8.7	12	13	7.7
MAY								
24...	2115	4.6	300	7.3	25	27	35	26
24...	2125	3.8	310	7.2	24	26	38	24
24...	2135	3.0	290	7.5	22	25	35	23
24...	2145	2.2	290	7.5	22	23	33	22
24...	2155	1.7	280	7.3	21	22	35	23
24...	2205	1.3	310	7.5	23	26	36	23
24...	2215	1.2	320	7.3	22	28	37	23

TABLE 42.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR, JANUARY 1976 TO DECEMBER 1976

		INSTAN- TANEOUS DTS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	DTS- SOLVED CAL- CIUM (CA) (MG/L)	DTS- SOLVED SODIUM (NA) (MG/L)	DTS- SOLVED MAN- GANESE (MN) (MG/L)	DTS- SOLVED SULFATE (SO4) (MG/L)	DTS- SOLVED CHLO- RIDE (CL) (MG/L)
MAY									
24...	2235	.84	320	7.5	25	30	--	40	24
24...	2245	.67	340	7.5	26	28	--	42	24
24...	2255	.57	310	7.5	27	31	--	43	26
24...	2305	.52	340	7.6	27	28	--	45	27
24...	2315	.44	340	7.5	27	28	--	46	28
24...	2325	.42	400	7.4	28	35	--	45	33
24...	2335	.39	400	7.6	29	36	--	44	36
24...	2345	.39	400	7.6	30	31	--	46	30
24...	2355	.37	420	7.6	31	40	--	48	40
AUG									
02...	0942	.26	430	8.2	33	47	--	65	28
02...	1220	4.5	460	8.0	29	53	--	51	67
02...	1225	12	240	7.8	17	28	--	27	28
02...	1230	40	120	7.8	8.7	10	--	15	8.8
02...	1232	F50	110	7.7	9.1	8.2	--	14	7.0
02...	1235	F52	100	7.6	9.9	6.1	--	12	6.9
02...	1240	E55	85	7.5	7.3	4.4	--	10	4.9
02...	1245	E54	80	7.5	6.8	3.9	--	9.4	4.1
02...	1250	F55	70	7.5	6.1	3.3	--	8.8	3.6
02...	1255	F52	70	7.6	6.1	3.1	--	8.2	3.5
02...	1300	F47	65	7.6	6.1	2.9	--	7.8	3.2
02...	1305	F45	70	7.5	6.2	3.3	--	8.0	4.3
02...	1310	42	70	7.5	6.2	3.2	--	8.2	3.4
02...	1315	42	70	7.4	6.3	3.8	--	8.2	3.4
02...	1325	42	75	7.4	6.6	3.3	--	8.7	3.9
02...	1335	E46	75	7.4	6.2	3.4	--	8.5	4.1
02...	1345	38	70	7.5	6.2	3.3	--	8.7	3.6
02...	1400	21	75	7.4	6.4	4.5	--	9.3	3.7
02...	1415	13	85	7.4	7.2	4.2	--	9.6	4.3
SEP									
21...	1625	.50	135	7.4	--	--	90	--	--
27...	1020	12	275	7.7	17	25	--	13	57
OCT									
04...	0715	.19	700	8.5	49	79	20	120	46
05...	1015	.18	616	7.9	45	60	--	100	41
06...	1115	.46	540	7.2	41	53	--	81	44
06...	1120	1.0	465	7.5	38	45	--	75	42
06...	1125	11	450	8.4	28	68	--	70	37
06...	1130	18	330	7.8	25	27	160	45	29
06...	1135	25	590	8.5	45	55	--	43	120
06...	1140	73	269	7.8	21	19	--	35	28
06...	1145	101	220	7.3	18	14	--	30	17
DATE	TIME	INSTAN- TANEOUS DTS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	DTS- SOLVED CAL- CIUM (CA) (MG/L)	DTS- SOLVED SODIUM (NA) (MG/L)	DTS- SOLVED SULFATE (SO4) (MG/L)	DTS- SOLVED CHLO- RIDE (CL) (MG/L)	
OCT									
06...	1150	153	200	7.3	16	12	27	13	
06...	1200	149	131	7.3	10	6.2	17	7.9	
06...	1205	71	121	7.5	9.5	5.5	15	6.5	
06...	1210	60	120	7.3	9.4	5.9	15	6.7	
06...	1215	52	116	7.3	8.9	5.4	14	6.5	
06...	1220	40	110	7.2	8.5	5.2	15	6.5	
06...	1225	34	110	7.2	8.7	5.8	14	6.4	
06...	1235	36	105	7.4	8.7	5.3	14	5.8	
06...	1255	60	93	7.5	7.5	4.9	11	6.0	
06...	1305	71	80	7.5	6.7	4.3	10	5.0	
06...	1320	50	75	7.7	6.2	3.7	8.5	4.6	
06...	1330	55	70	7.6	5.8	3.3	8.4	4.4	
06...	1340	38	70	7.4	5.7	3.4	8.5	4.4	
06...	1350	27	75	7.4	6.1	3.9	9.0	5.0	
06...	1405	14	80	7.4	6.4	4.8	9.7	5.2	
06...	1420	11	87	7.4	6.9	5.4	11	5.4	
06...	1435	7.4	95	7.4	7.5	5.3	12	7.6	
06...	1450	4.8	100	7.4	8.4	6.3	13	6.4	
06...	1515	2.6	110	7.4	8.9	6.8	14	7.0	

TABLE 42.--MAJOR CONSTITUENT WATER-QUALITY DATA FOR STATION
06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	ALKA- LITY AS CACO3 (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)
FEB										
14...	0940	.41	1180	7.6	90	40	50	8.3	3.7	29
14...	0950	.53	1020	7.7	86	39	48	7.5	3.9	28
14...	1000	.81	1480	8.2	89	41	48	12	3.4	29
14...	1015	2.2	1620	7.2	86	43	43	13	3.5	28
14...	1030	5.9	3100	7.1	120	82	38	23	3.4	41
14...	1045	8.7	3640	7.3	140	100	33	25	2.9	48
14...	1100	9.5	3290	7.1	140	110	36	22	2.8	51
14...	1115	9.7	2890	8.1	150	110	41	19	3.2	55
14...	1130	8.7	2610	7.7	130	100	30	18	2.7	46
14...	1145	8.4	2330	7.5	120	89	29	17	2.5	42
14...	1205	7.4	2100	7.1	110	83	31	15	2.2	41
14...	1230	5.9	2200	7.9	150	120	27	13	2.8	50
14...	1300	3.6	2300	7.1	160	130	28	14	2.8	53
14...	1330	2.8	1910	7.1	110	79	30	14	2.7	39
14...	1400	2.0	1640	7.2	100	68	33	13	2.9	35
14...	1430	1.8	1480	7.4	93	59	34	11	3.4	32
14...	1500	1.8	1360	7.6	92	32	60	10	3.4	32

DATE	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)
FEB									
14...	4.3	180	6.3	170	61	0	49	290	.8
14...	4.0	160	5.7	150	58	0	46	250	1.1
14...	4.0	250	5.8	180	59	0	48	380	.9
14...	3.9	280	5.4	170	52	0	47	420	.8
14...	4.3	580	7.0	220	46	0	56	920	.7
14...	4.0	670	7.8	280	40	0	49	1100	.7
14...	4.0	600	8.1	250	44	0	56	1000	.6
14...	3.6	530	8.0	200	50	0	48	910	.6
14...	3.5	470	8.1	250	36	0	40	920	.5
14...	3.2	420	7.8	220	35	0	38	720	.5
14...	2.8	360	7.7	200	38	0	36	640	.5
14...	5.6	360	7.5	210	33	0	36	670	.6
14...	5.7	390	7.4	180	34	0	36	710	.6
14...	3.6	330	7.1	170	37	0	37	570	.6
14...	3.2	290	7.0	190	40	0	39	470	.6
14...	3.2	250	6.5	180	41	0	40	400	.7
14...	3.0	230	6.3	190	73	0	41	380	.7

Nutrients, Biochemical Oxygen Demand, Coliform Bacteria, and Solids

Samples were analyzed for the following nutrients and related parameters: total nitrate, total nitrite, total nitrite plus nitrate, total ammonia, total organic nitrogen, total Kjeldahl nitrogen, total nitrogen, dissolved phosphorus, total orthophosphate, dissolved organic carbon, suspended organic carbon, biochemical oxygen demand 5-day, total- (immediate) coliform bacteria, fecal-coliform bacteria, fecal-streptococcus bacteria, dissolved solids, total nonfilterable residue, volatile nonfilterable residue, and suspended sediment. Biochemical oxygen demand data are probably affected by the presence of trace elements in the samples. Results of the analyses from the Littleton catchment area are presented in table 43, for the Lakewood catchment area in table 44, and for the Denver catchment area in table 45.

TABLE 43.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON

[E indicates estimated, > indicates greater than]

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTANTANEOUS DTS- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJL- DAHL- NITRO- GEN (N) (MG/L)	TOTAL NITRO- GEN (N) (MG/L)
MAR									
06...	1135	E.20	3.3	.08	3.4	.00	1.5	1.5	4.9
06...	1235	F.50	.80	.06	.86	.00	2.4	2.4	3.3
06...	1335	F.30	.67	.05	.72	.00	3.1	3.1	3.8
06...	1435	F.20	.69	.05	.74	.04	2.3	2.3	3.0
06...	1535	F.10	.73	.05	.78	.09	1.9	2.0	2.8
29...	0925	F.30	.33	.04	.37	.09	1.4	1.5	1.9
29...	0935	F.50	.30	.04	.34	.04	1.2	1.2	1.5
29...	0945	E.30	.31	.04	.35	.08	1.0	1.1	1.5
29...	0955	F.20	.30	.04	.34	.09	1.1	1.2	1.5
APR									
29...	2200	E14	.72	.04	.76	.35	3.9	4.2	5.0
29...	2205	E13	.66	.04	.70	.51	.69	1.2	1.9
29...	2210	E12	.62	.04	.66	.44	1.9	2.3	3.0
29...	2215	E10	.61	.02	.63	.52	1.4	1.9	2.5
29...	2220	F9.1	.59	.03	.62	.45	1.6	2.0	2.6
29...	2225	F8.1	.57	.03	.60	.38	1.1	1.5	2.1
29...	2230	F7.7	.55	.04	.59	.44	1.4	1.8	2.4
29...	2235	F7.7	.74	.04	.78	.44	1.1	1.5	2.3
29...	2240	F7.8	.75	.05	.80	.39	1.4	1.8	2.6
29...	2245	F7.8	.73	.05	.78	.37	.51	.88	1.7
29...	2255	F7.1	.72	.04	.76	.35	1.5	1.9	2.7
29...	2300	F6.8	.79	.04	.83	.35	1.3	1.6	2.4
29...	2305	E4.6	--	--	--	--	--	--	--
29...	2310	E6.5	.67	.04	.71	.34	1.4	1.7	2.4
29...	2315	F6.0	.65	.04	.69	.24	1.4	1.6	2.3
29...	2320	F5.2	.62	.04	.66	.32	1.6	1.9	2.6
29...	2325	E4.4	.65	.04	.69	.35	1.1	1.4	2.1
29...	2330	E3.9	.65	.04	.69	.33	1.3	1.6	2.3
29...	2335	E3.3	.65	.04	.69	.32	1.4	1.7	2.4
29...	2345	F3.8	.66	.04	.70	.29	1.2	1.5	2.2
29...	2350	F4.4	.68	.04	.72	.30	1.3	1.6	2.3
29...	2355	E5.1	.63	.04	.67	.40	1.1	1.5	2.2
MAY									
25...	1754	--	1.2	.05	1.2	.42	1.5	1.9	3.1
30...	1350	49	.88	.04	.92	.45	3.4	3.8	4.7
30...	1355	60	.84	.04	.88	.44	3.7	4.1	5.0
30...	1400	63	.79	.04	.83	.40	3.3	3.7	4.5
30...	1405	54	.82	.03	.85	.48	2.4	2.9	3.8
30...	1410	39	.66	.03	.69	.44	2.4	2.8	3.5
30...	1415	19	.72	.04	.76	.46	1.5	2.0	2.8
30...	1420	E12	.77	.04	.81	.44	1.4	1.8	2.6

TABLE 43.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON--CONTINUED

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	DIS- SOL- VED PHOS- PHORUS (P) (MG/L)	TOTAL ORTHOPHOS- PHOS- PHORUS (P) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 140 C) (MG/L)	TOTAL NON- FILLT- TABLE RESIDUE (MG/L)	NON- FILLT- TABLE RESIDUE (MG/L)
MAR								
06...	.03	.01	--	--	16	1340	69	21
06...	.04	.10	--	--	20	601	402	106
06...	.04	.08	--	--	19	404	424	84
06...	.07	.11	--	--	17	293	296	14
06...	.03	.04	--	--	14	302	224	22
29...	.06	.12	8.6	--	23	43	137	49
29...	.03	.13	7.3	--	10	62	163	62
29...	.06	.12	8.6	--	10	43	119	46
29...	.07	.13	15	>10	10	44	43	24
APR								
29...	.16	.10	7.9	<5.0	--	46	84	34
29...	.07	.11	7.5	>5.0	8.0	29	43	6
29...	.07	.10	5.7	>5.0	9.0	34	110	21
29...	.10	.04	7.1	>5.0	10	39	142	42
29...	.11	.07	6.4	>5.9	12	50	192	50
29...	.13	.09	7.1	>5.0	14	39	104	33
29...	.04	.10	6.0	>5.0	10	36	55	3
29...	.10	.13	7.6	>5.0	8.0	44	74	20
29...	.10	.13	7.4	4.1	6.0	47	62	12
29...	.11	.12	8.2	5.6	6.0	45	27	4
29...	.13	.13	4.4	2.4	7.2	47	110	44
29...	.12	.14	8.7	1.3	5.4	46	45	4
29...	--	--	--	--	6.0	--	--	--
29...	.13	.14	4.1	1.3	5.2	47	54	7
29...	.12	.14	7.8	1.0	5.6	44	61	9
29...	.13	.12	7.8	1.6	6.4	51	36	1
29...	.14	.14	10	2.9	5.2	54	37	0
29...	.13	.16	7.9	1.3	5.6	54	46	0
29...	.35	.15	8.0	1.1	4.4	65	37	0
29...	.55	.51	8.5	--	5.2	65	31	0
29...	.14	.16	7.9	1.8	5.6	64	45	10
29...	.14	.14	9.7	1.8	5.2	58	45	4
MAY								
25...	.35	.31	--	--	--	106	180	49
30...	.29	.17	--	--	46	70	856	132
30...	.31	.17	10	--	32	112	513	89
30...	.27	.15	--	--	32	60	676	104
30...	.36	.17	12	--	26	54	440	54
30...	--	.15	11	--	30	53	440	74
30...	.36	.18	16	--	36	59	394	50
30...	.25	.17	5.6	--	38	36	424	56

TABLE 43.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON--CONTINUED

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJFL- DAHL NITRO- GEN (N) (MG/L)
MAY								
30...	1425	E7.0	.87	.06	.93	.47	1.7	2.2
30...	1430	E4.0	1.2	.05	1.2	.43	1.7	2.1
30...	1435	E3.0	1.1	.06	1.2	.45	1.9	2.3
30...	1440	E2.0	1.1	.05	1.1	.43	1.7	2.1
30...	1445	E1.0	1.1	.05	1.1	.42	1.8	2.2
30...	1450	E1.0	.47	.02	.49	.34	1.2	1.6
30...	1455	E.50	.24	.01	.25	.35	1.4	1.7
30...	1500	E.20	1.1	.05	1.1	.42	1.4	1.8
JUL								
25...	1746	30	.80	.05	.85	.67	4.1	4.8
25...	1750	52	.89	.05	.94	1.2	1.4	2.6
25...	1754	65	.60	.05	.65	1.1	3.2	4.3
25...	1808	46	.55	.04	.59	.84	2.4	3.2
25...	1820	E4.0	.62	.04	.66	.62	2.2	2.8
25...	1832	E1.0	.79	.07	.86	.61	1.5	2.1
25...	1836	E.50	.71	.05	.76	.68	1.5	2.2
25...	1840	E.20	.81	.05	.86	.64	2.1	2.7
25...	1844	E.20	.94	.06	1.0	.61	3.7	4.3
25...	1858	E.20	1.2	.05	1.2	.36	2.0	2.4
25...	1902	E.20	1.2	.05	1.2	.21	1.8	2.0
25...	1906	E.20	1.2	.05	1.2	.40	1.4	1.8
25...	1910	E.20	1.3	.05	1.3	.45	1.5	1.9
25...	1924	E.20	1.3	.05	1.3	.44	1.3	1.7
25...	1928	E.20	1.3	.05	1.3	.45	.75	1.2
25...	1932	E.20	1.3	.05	1.3	.44	.96	1.4
25...	1936	E.20	1.2	.06	1.3	.42	1.1	1.5
25...	1948	E.20	1.2	.06	1.3	.44	.86	1.3
25...	1952	E.20	1.2	.07	1.3	.39	1.0	1.4
25...	2006	E.20	1.2	.07	1.3	.41	.89	1.3
25...	2018	E.20	1.1	.08	1.2	.41	.89	1.3
25...	2022	E.20	1.2	.08	1.3	.35	.75	1.1
25...	2026	E.20	1.1	.08	1.2	.27	1.5	1.8
AUG								
01...	0214	E3.3	.81	.08	.89	1.1	3.8	4.9
01...	0226	E16	.83	.07	.90	.50	1.7	2.2
01...	0230	E17	.81	.04	.85	.50	.90	1.4
01...	0234	E17	.71	.04	.75	.52	1.7	2.2
01...	0238	F18	.61	.03	.64	.54	1.3	1.8
01...	0242	E19	.57	.04	.61	.40	.80	1.2
01...	0246	E20	.44	.02	.46	.38	.60	.98
01...	0250	E24	.38	.02	.40	.35	.42	.77

TABLE 43.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

		DIS- SOL- VED- PHOS- PHORUS (P) (MG/L)	TOTAL ORTHOPHOS- PHORUS (P) (MG/L)	DIS- SOL- VED- ORGANIC CARBON (C) (MG/L)	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
DATE	TOTAL NITRO- GEN (N) (MG/L)							
MAY								
30...	3.1	.25	.21	5.4	40	42	352	42
30...	3.3	.37	.26	4.7	34	76	209	32
30...	3.5	.35	.29	15	36	114	162	31
30...	3.2	.36	.24	15	26	104	154	28
30...	3.3	.35	.24	14	--	104	124	9
30...	2.1	.37	.10	15	--	152	140	12
30...	2.0	--	.04	14	--	122	92	13
30...	2.9	.40	.32	15	--	126	72	15
JUL								
25...	5.7	.22	.16	--	50	188	1340	268
25...	3.5	.26	.19	--	42	86	217	55
25...	5.0	.28	.21	--	42	75	1160	210
25...	3.4	.24	.19	--	33	67	671	116
25...	3.5	.20	.16	--	34	106	1060	102
25...	3.0	.22	.20	--	31	134	269	58
25...	3.0	.24	.20	--	31	140	246	56
25...	3.6	.28	.24	--	25	133	334	68
25...	5.3	.32	.28	--	25	109	733	129
25...	3.6	.33	.24	--	25	112	350	72
25...	3.2	.32	.25	--	25	101	333	69
25...	3.0	.34	.28	--	23	105	246	54
25...	3.2	.39	.35	--	25	124	116	62
25...	3.0	.36	.35	--	23	130	104	44
25...	2.5	.36	.36	--	25	133	94	41
25...	2.7	.37	.37	--	25	141	69	37
25...	2.8	.38	.38	--	25	150	34	28
25...	2.6	.37	.39	--	23	156	52	34
25...	2.7	.38	.35	--	20	158	35	24
25...	2.6	.38	.38	--	18	165	24	14
25...	2.5	.38	.36	--	17	165	35	21
25...	2.4	.38	.39	--	17	162	28	24
25...	3.0	.31	.29	--	19	148	66	29
AUG								
01...	5.8	.34	.31	--	--	214	1030	196
01...	3.1	.27	.15	--	--	91	228	49
01...	2.2	.22	.14	--	--	73	62	22
01...	3.0	.23	.14	--	--	68	212	45
01...	2.4	.19	.14	--	--	61	54	25
01...	1.8	.21	.14	--	--	52	117	33
01...	1.4	.20	.14	--	--	42	95	30
01...	1.2	.21	.14	--	--	40	108	32
DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CF5)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)
AUG								
01...	0304	E29	.26	.01	.27	.24	.48	.72
01...	0318	E21	.24	.02	.26	.20	.26	.46
01...	0330	E15	.28	.01	.29	.20	.07	.27
01...	0334	E14	.30	.01	.31	.22	.20	.42
01...	0338	E12	1.8	.02	1.8	.21	.13	.34
SEP								
25...	0804	E5.0	.66	.04	.70	.25	.75	1.0
27...	1130	.10	.69	.04	.73	.03	.17	.20
DATE		DIS- SOL- VED- PHOS- PHORUS (P) (MG/L)	TOTAL ORTHOPHOS- PHORUS (P) (MG/L)	DIS- SOL- VED- ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
AUG								
01...	.99	.17	.12	--	--	27	124	32
01...	.72	.15	.13	--	--	28	105	29
01...	.56	.16	.13	--	--	39	79	25
01...	.73	.17	.13	--	--	41	57	38
01...	2.1	.17	.13	--	--	54	49	18
SEP								
25...	1.7	.13	.10	10	--	39	150	38
27...	.93	.41	.35	13	3.2	186	19	18

TABLE 43.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)
APR								
18...	1525	3.3	1.8	.22	2.0	.56	3.3	3.9
18...	1535	3.2	1.9	.07	2.0	.85	2.0	2.8
18...	1545	2.5	1.9	.08	2.0	.86	1.7	2.6
18...	1555	2.0	1.8	.08	1.9	.91	1.8	2.7
18...	1605	1.9	1.7	.08	1.8	.82	2.1	2.9
18...	1615	1.7	1.7	.08	1.8	.81	1.8	2.6
18...	1625	1.5	1.6	.08	1.7	.81	1.7	2.5
JUN								
11...	1515	30	.60	.06	.66	.65	8.9	9.5
11...	1520	48	.73	.05	.78	.63	.77	1.4
11...	1525	61	.62	.05	.67	.53	1.8	2.3
11...	1530	81	.44	.05	.49	.43	2.4	2.8
11...	1535	91	.53	.05	.58	.42	1.1	1.5
11...	1540	96	.51	.05	.56	.47	.83	1.3
11...	1545	90	.42	.05	.47	.46	1.7	2.2
11...	1550	76	.48	.05	.53	.44	.39	.83
11...	1555	60	.71	.04	.75	.42	.38	.80
11...	1600	56	.41	.05	.46	.38	1.1	1.5
11...	1605	44	.63	.04	.67	.42	.57	.99
11...	1610	29	.62	.05	.67	.47	.51	.98
11...	1615	21	.76	.05	.81	.42	1.3	1.7
11...	1620	12	.74	.05	.79	.43	.77	1.2
11...	1625	9.1	.81	.05	.86	.42	.98	1.4
11...	1630	7.0	.83	.05	.88	.43	1.1	1.5
11...	1635	5.5	.81	.05	.86	.43	.87	1.3
11...	1640	5.0	.93	.05	.98	.43	.97	1.4
11...	1645	4.6	.80	.06	.86	.43	1.2	1.6
11...	1650	4.1	.90	.06	.96	.44	.66	1.1
11...	1655	4.0	.91	.06	.97	.42	.68	1.1
11...	1700	3.9	.89	.06	.95	.45	.36	.81
11...	1705	3.5	.94	.06	1.0	.42	1.2	1.6
11...	1710	3.4	.89	.06	.95	.41	.53	.94

DATE	TOTAL NITRO- GEN (N) (MG/L)	DIS- SOL- VED PHOS- PHORUS (P) (MG/L)	TOTAL ORTHOPHOS- PHORUS (P) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
APR								
18...	5.9	.09	.07	28	>25	220	472	112
18...	4.8	.13	.19	27	18	144	82	42
18...	4.6	.09	.14	28	>25	134	80	46
18...	4.6	.15	.25	26	9.1	129	44	40
18...	4.7	.15	.19	24	17	122	164	60
18...	4.4	.13	.17	23	10	126	210	66
18...	4.2	.11	.17	22	18	135	196	62
JUN								
11...	10	.30	.28	30	>25	102	984	220
11...	2.2	.23	.29	20	>25	71	794	218
11...	3.0	.20	.25	19	>25	64	880	218
11...	3.3	.18	.25	18	>25	56	764	200
11...	2.1	.20	.27	12	>25	53	772	190
11...	1.9	.19	.29	11	>25	52	344	148
11...	2.7	.19	.27	8.7	>25	45	390	168
11...	1.4	.22	.27	8.6	19	48	376	122
11...	1.6	.24	.28	9.0	20	54	252	144
11...	2.0	--	--	--	--	--	--	--
11...	1.7	.25	.28	10	--	59	300	122
11...	1.7	.29	.31	11	11	65	346	112
11...	2.5	.28	.37	11	21	69	306	142
11...	2.0	.33	.39	11	17	85	232	104
11...	2.3	.33	.40	12	14	95	276	106
11...	2.4	.33	.40	13	15	109	224	92
11...	2.2	.34	.39	--	15	110	116	68
11...	2.4	.36	.37	13	14	115	220	102
11...	2.5	.35	.43	12	12	116	180	136
11...	2.1	.36	.42	13	8.5	117	164	124
11...	2.1	.40	.44	14	8.6	116	180	88
11...	1.8	.42	.42	14	7.5	125	112	64
11...	2.6	.40	.44	13	9.2	119	98	76
11...	1.9	.42	.43	14	10	129	128	100

TABLE 44.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD

[E indicates estimated, > indicates greater than,
< indicates less than, B indicates nonideal count]

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTAN- TANFOUS DIS- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)	TOTAL NITRO- GEN (N) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L)
MAR										
06...	1145	F.10	.89	.10	.99	.03	3.2	3.2	4.2	.01
06...	1231	F.10	.99	.11	1.1	.00	4.5	4.5	5.6	.02
29...	0940	E.15	.35	.05	.40	.00	3.3	3.3	3.7	.03
29...	1030	E.10	.29	.06	.35	2.3	1.1	3.4	3.8	.03
29...	1130	E.05	.40	.05	.45	.01	3.1	3.1	3.6	.08
29...	1230	E.03	.45	.04	.49	.04	3.3	3.3	3.8	.05
29...	1400	E.03	.58	.04	.62	.04	3.7	3.7	4.3	.09
29...	1430	E.03	--	--	--	--	--	--	--	--
JUN										
17...	1328	E3.0	.18	.08	.26	.57	2.4	3.0	3.3	--
17...	1330	E5.3	.32	.10	.42	.55	.84	1.4	1.8	--
17...	1332	E3.5	.68	.08	.76	.48	.92	1.4	2.2	--
17...	1335	E2.0	.73	.01	.74	.35	1.1	1.5	2.2	--
17...	1340	E5.5	.50	.05	.55	.45	.84	1.3	1.9	--
17...	1350	E3.2	.59	.05	.64	.40	1.4	1.8	2.4	--
17...	1400	E2.0	.68	.02	.70	.57	1.7	2.3	3.0	--
JUL										
19...	1820	E4.6	.53	.07	.60	.31	3.2	3.5	4.1	.20
19...	1822	E5.2	.52	.08	.60	.21	2.2	2.4	3.0	.21
19...	1824	E6.0	.57	.06	.63	.32	1.5	1.8	2.4	.24
19...	1825	E6.2	.52	.08	.60	.35	1.7	2.1	2.7	.22
19...	1828	E5.8	.54	.07	.61	.34	1.4	1.7	2.3	.21
19...	1830	E3.7	.54	.07	.61	.35	1.4	1.7	2.3	.22
19...	1832	E4.6	.57	.05	.62	.39	2.0	2.4	3.0	.22
19...	1834	E4.0	.55	.06	.61	.37	1.9	2.3	2.9	.22
19...	1836	E3.7	.54	.07	.61	.37	1.8	2.2	2.8	.22
19...	1838	E3.3	.54	.07	.61	.35	2.1	2.4	3.0	.21
19...	1840	E3.0	.56	.06	.62	.40	1.5	1.9	2.5	.22
19...	1842	E2.8	.56	.05	.61	.38	2.3	2.7	3.3	.22
19...	1844	E2.6	.57	.06	.63	.38	2.0	2.4	3.0	.23
19...	1846	E2.4	.56	.07	.63	.41	2.0	2.4	3.0	.22
19...	1848	E2.2	.57	.06	.63	.41	1.9	2.3	2.9	.22
19...	1850	E2.1	.58	.06	.64	.43	1.8	2.2	2.8	.22
19...	1852	E2.0	.57	.06	.63	.41	1.7	2.1	2.7	.22
19...	1854	E1.8	.60	.06	.66	.39	1.8	2.2	2.9	.22
19...	1856	E1.6	.62	.06	.68	.35	1.8	2.1	2.8	.21
19...	1858	E1.5	.64	.05	.69	.43	1.8	2.2	2.9	.24
19...	1900	E1.4	.63	.06	.69	.42	.98	1.4	2.1	.22
19...	1902	E1.3	.63	.06	.69	.42	1.7	2.1	2.8	.25
19...	1904	E1.2	.67	.06	.73	.40	1.7	2.1	2.8	.24
19...	1906	E1.2	.64	.07	.71	.45	2.3	2.7	3.4	.22

TABLE 44.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD--CONTINUED

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TOTAL ORTHOPHOS- PHORUS (P) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L) 5 DAY	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)	STREP- TOCOCCI (COL- ONIES PER 100 ML)	DIS- SOLVED SOLIDS (RESI- DUES AT 140 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL- NON- FILT- RABLE RESIDUE (MG/L)
MAR										
06...	.00	--	--	--	--	--	--	934	618	114
06...	.00	--	--	--	--	--	--	946	2360	296
29...	.02	11	6.2	40	--	--	--	355	968	184
29...	.06	9.7	>10	39	--	--	--	296	1160	174
29...	.07	--	--	39	--	--	--	227	1450	310
29...	.01	11	6.9	36	--	--	--	408	972	123
29...	.04	14	>10	--	--	--	--	347	1550	208
29...	--	--	--	38	--	--	--	--	--	--
JUN										
17...	.19	24	--	46	R40000	<10000	<10000	170	3410	387
17...	.22	--	7.2	60	R20000	<100	R300	182	376	56
17...	.22	22	7.0	60	R1000	R300	R1000	114	306	41
17...	.21	--	6.0	58	R200	R100	<100	90	72	15
17...	.24	16	5.2	56	<100	<100	<100	114	285	55
17...	.23	15	5.0	55	<100	<100	<100	130	455	69
17...	.28	23	6.8	50	<100	<100	<100	114	608	75
JUL										
19...	.23	21	--	35	--	--	--	73	1080	140
19...	.25	18	--	35	--	--	--	66	1110	160
19...	.27	20	1.0	22	--	--	--	66	906	140
19...	.27	19	6.0	20	--	--	--	80	828	132
19...	.28	19	7.0	16	--	--	--	68	874	140
19...	.27	19	7.6	18	--	--	--	65	938	136
19...	.25	--	8.2	17	--	--	--	70	774	140
19...	.26	19	7.5	--	--	--	--	67	772	140
19...	.26	20	4.5	--	--	--	--	70	666	124
19...	.28	18	--	--	--	--	--	66	710	124
19...	.26	--	2.9	--	--	--	--	73	742	128
19...	.24	18	9.5	--	--	--	--	69	760	134
19...	.27	19	--	16	--	--	--	72	632	90
19...	.28	22	5.6	16	--	--	--	73	614	88
19...	.27	18	5.6	--	--	--	--	75	650	98
19...	.29	20	.3	--	--	--	--	70	614	96
19...	.26	--	--	--	--	--	--	66	602	118
19...	.26	--	11	--	--	--	--	83	574	120
19...	.28	--	--	--	--	--	--	79	574	118
19...	.27	19	--	--	--	--	--	83	518	108
19...	.26	--	--	--	--	--	--	83	606	118
19...	.26	20	15	14	--	--	--	67	632	121
19...	.29	19	--	13	--	--	--	72	648	132
19...	.28	--	12	11	--	--	--	72	698	122

TABLE 44.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD--CONTINUED

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

		INSTAN- TANEOUS DIS- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJFL- DAHL- NITRO- GEN (N) (MG/L)
DATE	TIME							
SEP								
14....	1442	E5.5	.89	.21	1.1	.88	3.7	4.6
14....	1444	F5.0	1.2	.15	1.3	1.7	1.0	2.7
14....	1446	F4.5	1.9	.19	2.1	3.5	2.8	6.3
14....	1450	E3.8	1.9	.10	2.0	3.8	3.5	7.3
14....	1454	E3.0	1.9	.15	2.0	4.5	3.1	7.6
14....	1458	E2.7	2.0	.10	2.1	4.9	2.4	7.3
14....	1500	E2.5	2.2	.15	2.3	5.6	1.2	6.8
14....	1504	E2.3	2.3	.08	2.4	7.0	4.0	11
14....	1510	E1.9	2.5	.08	2.6	8.1	3.9	12
14....	1520	E1.2	2.6	.07	2.7	8.1	1.4	9.5
27....	1055	E.50	1.2	.03	1.2	.04	.05	.09
OCT								
06....	1030	F.10	.10	1.0	1.1	.95	7.7	8.6
06....	1057	E2.5	.55	.25	.80	.54	3.0	3.6
06....	1129	E3.2	.21	.07	.28	.22	3.5	3.7
06....	1225	E2.1	.54	.05	.59	.22	2.0	2.2
06....	1258	F1.4	.38	.04	.42	.14	.96	1.1
06....	1343	F3.4	.72	.04	.76	.14	1.1	1.2
06....	1417	E2.8	.88	.02	.90	.14	.78	.92
		DTS- SOL- VED- PHOS- PHORUS (P) (MG/L)	TOTAL ORTHO- PHOS- PHORUS (P) (MG/L)	DTS- SOL- VED- ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	DTS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
DATE								
SEP								
14....	5.7	.16	.54	--	--	82	6460	808
14....	4.0	.27	.45	--	--	77	6400	808
14....	8.4	.55	.72	--	--	95	6120	808
14....	9.3	.70	.73	--	--	106	5620	736
14....	9.6	.68	.87	--	--	114	4180	516
14....	9.4	.84	.96	--	--	116	3520	454
14....	9.1	.95	1.1	--	--	135	3110	416
14....	13	.93	1.0	--	--	140	2930	364
14....	15	1.0	1.2	--	--	136	2200	300
14....	12	1.1	1.2	--	--	142	1870	272
27....	1.3	.06	.06	9.8	3.3	177	223	44
OCT								
06....	9.7	.10	.02	84	--	264	1960	326
06....	4.4	.08	.01	41	30	139	2600	354
06....	4.0	.12	.10	11	19	55	1100	102
06....	2.8	.16	.12	12	11	70	409	55
06....	1.5	.12	.11	9.0	9.9	60	438	60
06....	2.0	.18	.18	11	9.0	95	248	52
06....	1.8	.17	.12	12	8.5	117	202	42

TABLE 44.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJFL- DAHL- NITRO- GEN (N) (MG/L)	TOTAL NITRO- GEN (N) (MG/L)
FEB									
14...	1005	F3.0	.11	.22	.33	.27	3.1	3.4	3.7
14...	1015	E5.0	.34	.12	.46	.23	3.1	3.3	3.8
14...	1030	F7.0	.23	.15	.38	.22	3.4	3.6	4.0
14...	1100	F8.0	.44	.07	.51	.23	3.1	3.3	3.8
14...	1120	F8.0	.39	.08	.47	.09	2.9	3.0	3.5
14...	1130	F10	.45	.08	.53	.11	3.1	3.2	3.7
14...	1140	E8.0	.44	.07	.51	.02	3.2	3.2	3.7
14...	1150	F6.0	.42	.07	.49	.01	2.9	2.9	3.4
14...	1200	F5.0	.47	.07	.54	.05	2.0	2.0	2.5
14...	1215	E4.0	.47	.08	.55	.01	3.3	3.3	3.9
14...	1230	F3.0	.59	.07	.66	.22	3.0	3.2	3.9
14...	1300	E1.0	.50	.10	.60	.01	2.1	2.1	2.7
14...	1400	F.50	.45	.13	.58	.01	2.4	2.4	3.0
APR									
12...	1518	1.2	--	--	.77	.34	3.6	3.9	4.7
12...	1522	2.4	--	--	.64	.19	3.0	3.2	3.8
12...	1526	3.3	--	--	.63	.26	2.5	2.8	3.4
12...	1530	3.1	--	--	.63	.49	1.4	1.9	2.5
12...	1534	2.9	--	--	.67	.56	1.9	2.5	3.2
12...	1538	2.6	--	--	.71	.48	2.7	3.2	3.9
12...	1542	2.3	--	--	.56	.28	3.1	3.4	4.0
12...	1546	2.2	--	--	.54	.32	2.7	3.0	3.5
12...	1550	2.5	--	--	.48	.49	2.2	2.7	3.2
12...	1554	2.5	--	--	.43	.38	1.9	2.3	2.7
12...	1558	2.5	--	--	.41	.38	1.9	2.3	2.7
12...	1602	2.3	--	--	.40	.35	1.8	2.2	2.6
12...	1606	2.3	--	--	.42	.49	1.6	2.1	2.5
12...	1610	2.3	--	--	.40	.37	1.5	1.9	2.3
12...	1614	2.3	--	--	.39	.31	1.6	1.9	2.3
12...	1618	2.5	--	--	.39	.40	1.8	2.2	2.6
12...	1622	2.3	--	--	.42	.30	1.7	2.0	2.4
12...	1630	2.3	--	--	.40	.31	3.4	3.7	4.1
12...	1640	2.2	--	--	.39	.22	1.8	2.0	2.4
12...	1650	2.0	--	--	.36	.24	1.5	1.7	2.1
12...	1655	1.9	--	--	.36	.35	1.3	1.7	2.1
12...	1700	1.8	--	--	.36	.27	1.4	1.7	2.1
12...	1715	1.3	--	--	.38	.22	1.5	1.7	2.1
12...	1730	1.2	--	--	.39	.26	1.6	1.9	2.3
12...	1745	1.1	--	--	.38	.25	1.4	1.6	2.0
12...	1800	.70	--	--	.40	.20	1.4	1.6	2.0

TABLE 44.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L)	TOTAL ORTHOP- PHOS- PHORUS (P) (MG/L)	DIS- SOL- VED- ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL- NON- FILT- RABLE RESIDUE (MG/L)	SUS- PENDED SEDI- MENT (MG/L)
FFR								
14...	.08	.19	--	--	1120	1910	254	1780
14...	.04	.18	30	>25	925	1040	278	1300
14...	.07	.13	29	>25	1090	1110	260	1140
14...	.08	.05	27	>25	943	982	276	1090
14...	.08	.06	25	>25	774	942	226	980
14...	.09	.05	25	>25	727	918	238	814
14...	.10	.08	--	--	658	830	212	1010
14...	.09	.06	24	>25	631	918	222	921
14...	.09	.07	28	>25	613	1030	196	830
14...	.10	.11	26	>25	592	1080	216	827
14...	.12	.09	--	--	559	790	172	581
14...	.10	.09	33	>25	517	898	214	--
14...	.09	.09	--	--	499	918	174	1150
APR								
12...	--	.13	--	--	--	--	--	--
12...	--	.26	--	--	--	--	--	--
12...	--	.45	--	--	--	--	--	--
12...	--	.80	--	--	--	--	--	--
12...	--	.79	--	--	--	--	--	--
12...	--	.99	--	--	--	--	--	--
12...	--	.43	--	--	--	--	--	--
12...	--	.41	--	--	--	--	--	--
12...	--	1.0	--	--	--	--	--	--
12...	--	.32	--	--	--	--	--	--
12...	--	.42	--	--	--	--	--	--
12...	--	.37	--	--	--	--	--	--
12...	--	.97	--	--	--	--	--	--
12...	--	.47	--	--	--	--	--	--
12...	--	.47	--	--	--	--	--	--
12...	--	.50	--	--	--	--	--	--
12...	--	.44	--	--	--	--	--	--
12...	--	.34	--	--	--	--	--	--
12...	--	.43	--	--	--	--	--	--
12...	--	.35	--	--	--	--	--	--
12...	--	.04	--	--	--	--	--	--
12...	--	.31	--	--	--	--	--	--
12...	--	.40	--	--	--	--	--	--
12...	--	.27	--	--	--	--	--	--
12...	--	.33	--	--	--	--	--	--
12...	--	.31	--	--	--	--	--	--

TABLE 44.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	TIME	INSTANTANEOUS DTS- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)
APR								
12...	1815	.48	--	--	.43	.28	1.4	1.7
12...	1830	.30	--	--	.44	.24	1.4	1.6
12...	1845	.24	--	--	1.6	.32	1.5	1.8
19...	1410	1.0	1.5	.44	1.9	.70	3.1	3.8
19...	1415	1.3	1.3	.27	1.6	.58	4.0	4.6
19...	1425	1.5	1.2	.14	1.3	.28	2.6	2.9
19...	1435	1.7	.91	.09	1.0	.21	1.9	2.1
19...	1445	2.0	.66	.07	.73	.30	1.5	1.8
19...	1455	2.3	.59	.08	.67	.29	1.3	1.6
19...	1505	3.1	.46	.06	.52	.34	1.2	1.5
19...	1520	2.8	.38	.06	.44	.27	1.3	1.6
19...	1535	3.3	.33	.06	.39	.26	1.3	1.6
19...	1550	2.9	.39	.06	.45	.24	1.4	1.6
19...	1605	2.6	.40	.05	.45	.23	1.4	1.6
19...	1620	2.6	.37	.06	.43	.21	1.3	1.5
19...	1635	2.6	.35	.06	.41	.20	1.3	1.5
19...	1650	2.3	.37	.05	.42	.17	1.0	1.2
19...	1705	2.5	.35	.05	.40	.20	1.0	1.2
19...	1720	2.0	.36	.06	.42	.19	1.0	1.2
19...	1735	1.7	.45	.07	.52	.28	1.0	1.3
19...	1750	1.6	.36	.07	.43	.21	.84	1.1
19...	1805	1.9	.39	.07	.46	.20	.80	1.0
19...	1820	2.5	.37	.06	.43	.20	.90	1.1
19...	1835	2.9	.72	.05	.77	.24	.73	.97
19...	1850	3.3	.37	.05	.42	.21	1.2	1.4

DATE	TOTAL NITRO- GEN (N) (MG/L)	DTS- SOL- VED- PHOS- PHOSPH- (P) (MG/L)	TOTAL ORTHOPHOS- PHOSPH- (P) (MG/L)	DTS- SOL- VED- ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	DTS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
APR								
12...	2.1	--	.07	--	--	--	--	--
12...	2.0	--	.33	--	--	--	--	--
12...	3.4	--	.08	--	--	--	--	--
19...	5.7	.03	.13	40	>25	148	848	152
19...	6.2	.02	.16	24	>25	122	608	144
19...	4.2	.02	.30	19	>25	110	836	144
19...	3.1	.02	.22	16	>25	77	748	128
19...	2.5	.02	.19	12	>25	63	400	84
19...	2.3	.04	.29	11	24	67	692	96
19...	2.0	.03	.22	7.8	21	56	732	132
19...	2.0	.03	.24	7.4	23	52	700	120
19...	2.0	.01	.23	6.4	23	50	548	96
19...	2.1	.01	.24	8.6	9.6	71	544	88
19...	2.1	.03	.20	8.4	11	71	496	96
19...	1.9	.03	.25	6.8	17	67	528	100
19...	1.9	.03	.25	7.1	13	67	456	104
19...	1.6	.04	.19	7.1	14	70	440	84
19...	1.6	.04	.18	6.8	17	61	374	68
19...	1.6	.02	.20	6.9	12	69	398	76
19...	1.8	.04	.37	6.8	9.2	79	292	60
19...	1.5	.02	.25	7.6	12	79	204	44
19...	1.5	.01	.25	7.7	17	77	288	64
19...	1.5	.01	.19	8.0	18	68	292	68
19...	1.7	.03	.12	7.2	13	125	236	60
19...	1.8	.02	.18	9.2	12	71	392	68

TABLE 45.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER

[E indicates estimated, > indicates greater than]

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTANTANEOUS DISEASE- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJFL- DAHL NITRO- GEN (N) (MG/L)	TOTAL NITRO- GEN (N) (MG/L)	DISEASE- VEIO- PHOS- PHORUS (P) (MG/L)	TOTAL ORTHOP- PHOS- PHORUS (P) (MG/L)
MAR											
05...	1320	13	.05	.01	.06	.03	4.7	4.7	4.8	.09	.01
05...	1400	15	.10	.05	.15	.00	4.6	4.6	4.8	1.0	.62
05...	1415	18	.24	.25	.53	.04	4.0	4.0	4.5	.41	.27
05...	1530	19	.80	.15	.95	.17	3.9	4.1	5.1	.11	.07
05...	1530	13	.75	.22	.97	.04	3.4	3.4	4.4	.10	.07
05...	1700	8.0	.54	.21	.75	.28	3.4	3.7	4.5	.12	.11
06...	1100	1.1	.91	.14	1.1	.13	3.0	3.1	4.2	2.1	.75
06...	1145	5.1	.16	.11	.27	.20	2.6	2.8	3.1	.80	.45
06...	1230	21	.24	.15	.39	.23	3.5	3.7	4.1	.26	.19
06...	1300	25	.31	.14	.45	.18	3.7	3.9	4.4	.17	.19
06...	1400	30	.58	.14	.72	.33	3.7	4.0	4.7	.17	.15
06...	1500	24	.77	.17	.94	.34	3.4	3.7	4.6	.15	.14
06...	1600	14	.72	.17	.89	.41	.56	.97	1.9	.28	.28
26...	1020	1.6	1.3	.13	1.4	1.1	2.6	3.7	5.1	.95	.25
26...	1030	1.9	1.2	.12	1.3	1.1	2.4	3.5	4.4	.58	.20
26...	1040	2.3	1.2	.12	1.3	1.0	2.3	3.3	4.6	.47	.19
26...	1050	2.7	.94	.11	1.1	.94	2.5	3.5	4.6	.71	.22
26...	1100	3.1	.91	.09	1.0	.97	2.5	3.5	4.5	.52	.19
26...	1110	3.7	.92	.08	1.0	.92	2.1	3.0	4.0	.47	.24
26...	1120	5.9	1.0	.09	1.1	1.1	2.4	3.5	4.6	.55	.21
26...	1130	9.2	1.0	.09	1.1	1.0	2.5	3.5	4.6	.53	.19
26...	1330	5.1	1.0	.10	1.1	1.1	2.4	3.5	4.6	.89	.37
26...	1400	1.6	1.1	.10	1.2	.98	2.6	3.5	4.8	1.5	.50
26...	1430	.90	1.2	.11	1.3	1.0	1.8	2.8	4.1	.95	.37
26...	1530	.30	1.4	.10	1.5	.88	2.0	2.9	4.4	1.7	.46
27...	1045	.22	.70	.09	.79	.35	2.1	2.4	3.2	.35	.21
28...	1600	.22	.05	.02	.07	.23	3.4	3.6	3.7	.51	.19
28...	1610	.23	.01	.02	.03	.27	2.4	2.7	2.7	.45	.27
28...	1620	.23	.35	.25	.60	.24	2.4	2.6	3.2	.38	.17
28...	1630	.22	.57	.05	.63	.24	1.7	1.9	2.5	.24	.17
28...	1640	31	.54	.05	.59	.24	1.8	2.0	2.6	.26	.16
28...	1650	37	.45	.05	.50	.23	1.9	2.1	2.6	.27	.16
28...	1700	42	.41	.05	.46	.24	1.8	2.0	2.5	.25	.17
28...	1710	38	.41	.05	.46	.23	1.5	1.7	2.2	.33	.17
28...	1720	36	.40	.05	.45	.23	1.7	1.9	2.4	.35	.18
29...	1045	5.6	--	--	--	--	--	--	--	--	--
29...	1100	7.2	.63	.11	.74	.35	1.9	2.2	2.9	1.2	.56
29...	1115	8.9	.60	.14	.74	.00	2.2	2.2	2.9	.96	.33
29...	1145	9.8	.74	.07	.81	.54	1.9	2.4	3.2	.30	.15

TABLE 45.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMF- DIATF COLI- FORM (COL. PER 100 ML)	FFCAL COLI- FORM (COL. PER 100 ML)	STREP- TOCOCCI (COL- ONIES PER 100 ML)	DIS- SOLVED SOLIDS (PESIT- DUE AT 19.0 C) (MG/L)	TOTAL NON- FILT- TABLE RESIDUE (MG/L)	VOL. NON- FILT- TABLE RESIDUE (MG/L)	SUS- PENDED SEDI- MENT (MG/L)
MAR										
03...	36	--	>35	--	--	--	5480	1100	297	1260
03...	32	>10	>35	--	--	--	4580	1060	267	1190
03...	30	>10	>35	--	--	--	4180	822	242	1050
03...	35	8.0	>35	--	--	--	3170	614	158	680
03...	25	>10	>35	--	--	--	2840	416	118	450
03...	27	>10	>35	--	--	--	2690	354	22	330
03...	--	--	--	--	--	--	929	136	49	--
03...	--	--	--	--	--	--	1600	176	50	--
03...	--	--	--	--	--	--	1420	364	10	--
03...	--	--	--	--	--	--	1260	420	36	--
03...	--	--	--	--	--	--	978	350	98	--
03...	--	--	--	--	--	--	777	212	76	--
03...	--	--	--	--	--	--	740	224	53	--
03...	16	2.1	53	57000	28000	27000	190	25	25	--
03...	21	1.6	42	59000	28000	17000	166	211	201	--
03...	22	>5.0	37	96000	14000	44000	167	31	25	--
03...	19	>5.0	36	96000	14000	32000	135	41	35	--
03...	18	>5.0	32	43000	2500	34000	117	63	42	--
03...	19	4.8	30	29000	2100	11000	132	70	28	--
03...	21	3.5	30	35000	2900	14000	122	88	37	--
03...	19	2.5	32	28000	6800	10000	122	64	28	--
03...	22	--	30	51000	2400	22000	140	27	12	--
03...	11	2.5	32	--	--	--	145	66	36	--
03...	20	2.3	32	85000	5100	44000	164	41	25	--
03...	16	1.5	32	--	--	--	193	20	20	--
03...	14	6.8	--	--	--	--	277	98	28	--
03...	50	--	56	--	--	--	231	117	62	--
03...	37	3.3	58	--	--	--	176	95	63	--
03...	27	--	40	--	--	--	158	66	25	--
03...	12	4.1	20	--	--	--	184	44	23	--
03...	13	--	22	--	--	--	140	42	38	--
03...	16	4.5	28	--	--	--	89	46	13	--
03...	13	--	20	--	--	--	82	47	28	--
03...	13	4.3	21	--	--	--	89	48	21	--
03...	13	3.4	25	--	--	--	79	48	19	--
03...	--	--	24	--	--	--	--	--	--	--
03...	13	6.9	20	--	--	--	246	90	28	--
03...	21	6.2	30	--	--	--	209	100	41	--
03...	16	--	26	--	--	--	114	50	24	--

TABLE 45.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TOTAL NITRATE (M) (MG/L)	TOTAL NITRITE (M) (MG/L)	TOTAL NITRITE PLUS NITRATE (M) (MG/L)	TOTAL AMMONIA NITROGEN (M) (MG/L)	TOTAL ORGANIC NITROGEN (M) (MG/L)	TOTAL KjELDAHL NITROGEN (M) (MG/L)	TOTAL NITROGEN (M) (MG/L)	DISTOLVED SOLVENTS PHOSPHORUS (P) (MG/L)
MAR										
29...	1200	9.8	.74	.10	.84	.52	2.3	2.8	3.6	.50
29...	1215	9.9	.72	.08	.80	.52	2.4	2.9	3.7	.39
29...	1245	9.5	.67	.09	.76	.30	1.9	2.2	3.0	.45
29...	1330	9.5	.69	.08	.77	.52	1.8	2.3	3.1	.38
29...	1430	2.2	.63	.06	.69	.46	1.8	2.3	3.0	.20
29...	1500	1.8	.73	.07	.80	.48	2.0	2.5	3.3	1.0
29...	1530	1.3	.50	.12	.62	.24	2.0	2.3	2.9	.47
29...	1600	.95	.72	.07	.79	.55	.85	1.4	2.2	.30
29...	1630	.77	.71	.07	.78	.58	1.7	2.3	3.1	.74
29...	1700	.62	.70	.06	.76	.53	1.5	2.0	2.8	.75
APR										
27...	2320	4.0	.45	.02	.47	.57	2.5	3.1	3.6	.22
29...	2200	3.1	.21	.12	.33	.93	3.4	4.3	4.6	.71
29...	2210	6.9	--	--	--	--	--	--	--	--
29...	2220	14	.23	.09	.32	1.1	4.5	5.6	5.9	.88
29...	2230	29	.32	.11	.43	.87	5.9	6.8	7.2	.28
29...	2240	42	.21	.05	.26	.13	8.7	8.8	9.1	.21
29...	2250	555	.58	.07	.65	.69	3.7	4.4	5.1	.25
29...	2300	555	.63	.01	.64	.71	3.9	4.6	5.2	.23
29...	2310	570	.58	.01	.59	.53	3.9	4.4	5.0	.25
29...	2320	555	--	--	--	--	--	--	--	--
29...	2330	550	.45	.05	.50	.58	1.5	2.1	2.6	.24
29...	2340	550	.44	.04	.48	.57	1.7	2.3	2.8	.19
29...	2350	42	.62	.06	.68	.69	1.5	2.2	2.9	.26
29...	2400	33	.46	.05	.51	.55	1.6	2.2	2.7	.21
30...	0020	21	.50	.05	.55	.61	2.2	2.8	3.4	.15
30...	0030	18	.52	.05	.57	.64	1.3	1.9	2.5	.17
30...	0040	15	.51	.06	.57	1.0	.70	1.7	2.3	.17
30...	0050	12	.58	.06	.64	.64	1.5	2.1	2.7	.68
30...	0100	10	.57	.05	.62	.68	1.6	2.3	2.9	.24
30...	0110	9.0	.60	.06	.66	.69	1.1	1.8	2.5	.19
30...	0120	8.0	.44	.04	.48	.55	1.5	2.0	2.5	.19
30...	0130	5.9	.62	.06	.68	.69	1.5	2.2	2.9	.25
30...	0140	5.1	.66	.07	.73	.67	2.1	2.8	3.5	.21
30...	0150	4.3	.68	.08	.76	.69	1.9	2.6	3.4	.23
MAY										
24...	2115	4.6	.33	.11	.44	1.5	4.3	5.8	6.2	--
24...	2125	3.8	1.3	.31	1.6	1.7	3.9	5.6	7.2	--
24...	2135	3.0	.70	.23	.93	1.7	3.4	5.1	6.0	--
24...	2145	2.2	1.5	.31	1.8	1.8	2.9	4.7	6.5	--
24...	2155	1.7	.55	.29	.84	1.7	3.0	4.7	5.5	1.3

TABLE 45.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TOTAL ORTHO- PHOS- PHORUS (P) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMPE- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)	STREPTO- COCCI (COL- ONIES PER 100 ML)	DIS- SOLVED SOLIDS (PES- TIC AT 140 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
MAR										
29...	.25	16	5.1	20	--	--	--	174	85	31
29...	.21	16	--	17	--	--	--	151	57	28
29...	.20	16	3.1	--	--	--	--	166	77	39
29...	.19	15	6.5	--	--	--	--	124	46	23
29...	.12	--	--	--	--	--	--	88	36	11
29...	.47	15	2.2	--	--	--	--	111	49	33
29...	.17	19	1.9	--	--	--	--	116	31	10
29...	.15	15	1.5	--	--	--	--	106	35	26
29...	.43	16	--	--	--	--	--	115	28	19
29...	.32	16	3.0	--	--	--	--	106	30	25
APR										
27...	.12	8.9	>5.0	--	--	--	--	38	383	95
29...	.21	31	>5.0	66	--	--	--	245	93	30
29...	--	28	>5.0	51	--	--	--	149	--	--
29...	.32	21	>5.0	41	--	--	--	--	--	--
29...	.14	18	5.5	28	--	--	--	--	--	--
29...	.12	14	4.9	17	--	--	--	--	--	--
29...	.11	11	>5.0	28	--	--	--	--	--	--
29...	.09	8.0	4.2	12	--	--	--	--	--	--
29...	.08	9.3	>5.0	11	--	--	--	--	--	--
29...	--	--	--	8.0	--	--	--	--	--	--
29...	.14	8.0	4.1	9.0	--	--	--	42	127	70
29...	.14	9.0	5.1	9.0	--	--	--	42	61	30
29...	.15	10	3.8	9.0	--	--	--	59	50	29
29...	.13	9.0	3.7	9.0	--	--	--	38	64	28
30...	.14	9.2	1.1	10	--	--	--	45	110	74
30...	.14	7.9	2.4	10	--	--	--	47	50	30
30...	.15	10	2.2	10	--	--	--	46	72	46
30...	.14	9.6	1.1	10	--	--	--	52	64	40
30...	.14	10	5.0	10	--	--	--	52	51	27
30...	.14	12	3.3	10	--	--	--	64	52	31
30...	.11	8.9	2.9	10	--	--	--	47	43	24
30...	.15	11	3.3	10	--	--	--	59	45	23
30...	.16	11	1.7	10	--	--	--	59	66	9
30...	.17	.9	1.9	10	--	--	--	62	31	8
MAY										
24...	.42	50	--	>68	180000	36000	18000	244	203	45
24...	.70	15	--	>70	150000	36000	19000	250	117	29
24...	.53	16	--	>68	420000	35000	61000	250	96	31
24...	.54	23	--	>69	230000	41000	44000	228	87	29
24...	.55	18	--	>65	360000	56000	88000	244	79	16

TABLE 45.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJFL- DAHL- NITRO- GEN (N) (MG/L)	TOTAL NITRO- GEN (N) (MG/L)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L)
MAY										
24...	2205	1.3	.68	.22	.90	1.4	3.3	4.7	5.6	2.0
24...	2215	1.2	1.0	.26	1.3	1.5	3.6	5.1	6.4	1.6
24...	2225	.99	--	--	--	--	--	--	--	--
24...	2235	.84	1.6	.21	1.8	1.4	2.9	4.3	6.1	1.2
24...	2245	.67	1.5	.30	1.8	1.1	3.5	4.6	6.4	1.2
24...	2255	.57	.97	.53	1.5	.65	3.4	4.0	5.5	1.1
24...	2305	.52	.18	.21	.39	.94	3.6	4.5	4.9	1.2
24...	2315	.44	.86	.24	1.1	1.3	2.8	4.1	5.2	1.0
24...	2325	.42	1.2	.37	1.6	1.2	2.7	3.9	5.5	.86
24...	2335	.39	1.5	.51	2.0	1.2	2.5	3.7	5.7	.95
24...	2345	.39	1.3	.29	1.6	1.0	2.5	3.5	5.1	.97
24...	2355	.37	1.2	.67	1.9	.91	2.3	3.2	5.1	1.1
JUN										
02...	0942	.26	1.4	.10	1.5	.88	2.6	3.5	5.0	.65
02...	1220	4.5	.88	.06	.94	.21	2.1	2.3	3.2	.57
02...	1225	12	.77	.13	.90	.42	1.7	2.1	3.0	1.1
02...	1230	40	.32	.05	.37	.42	2.0	2.4	2.8	.90
02...	1232	530	.34	.16	.50	.28	1.8	2.1	2.6	.27
02...	1235	532	.26	.15	.41	.15	2.6	2.7	3.1	.15
02...	1240	555	.60	.05	.65	.27	2.6	2.9	3.6	.25
02...	1245	558	.34	.13	.47	.18	2.1	2.3	2.8	.20
02...	1250	555	.59	.05	.64	.34	1.7	2.0	2.6	.14
02...	1255	552	.57	.05	.62	.24	1.6	1.8	2.4	.16
02...	1300	547	.27	.01	.28	.00	2.0	2.0	2.3	.16
02...	1305	545	.56	.03	.59	.11	1.6	1.7	2.3	.14
02...	1310	42	.51	.01	.52	.00	1.2	1.2	1.7	.17
02...	1315	42	.58	.03	.61	.13	1.2	1.3	1.9	.16
02...	1325	42	.60	.04	.64	.39	1.2	1.6	2.2	.19
02...	1335	546	.57	.05	.62	.40	1.1	1.5	2.1	.22
02...	1345	38	.57	.05	.62	.45	1.1	1.5	2.1	.22
02...	1400	21	.59	.05	.64	.45	.95	1.4	2.0	.21
02...	1415	13	.62	.05	.67	.52	1.1	1.6	2.3	.22
SEP										
27...	1020	12	.87	.01	.88	.05	.15	.21	1.1	.21
OCT										
04...	0715	.19	2.0	.15	2.1	.00	.95	.95	3.1	1.1
05...	1015	.18	1.0	.08	1.1	.17	.49	.66	1.8	.92
06...	1115	.46	.28	.08	.36	1.2	2.6	3.8	4.2	.74
06...	1120	1.0	.01	.01	.02	2.4	11	13	13	.80
06...	1125	11	.01	.01	.02	2.1	15	17	17	12
06...	1130	18	.05	.01	.06	1.2	6.6	7.8	7.9	2.0
06...	1135	25	.01	.01	.02	1.0	6.8	7.8	7.8	2.9

TABLE 45.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976										
DATE	TOTAL ORTHOPHOS- PHORUS (P) (MG/L)	NIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	BIO- CHEM- ICAL OXYGEN DEMAND (5 DAY (MG/L)	IMMF- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)	STREP- TOCOCOCT (COL. ONIFS PER 100 ML)	NIS- SOL VED SOLIDS (PESIT- ONE AT 140 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
MAY										
24...	.74	15	--	>68	200000	90000	40000	256	45	21
24...	.59	22	--	>68	110000	200000	--	256	46	14
24...	--	--	--	60	--	300000	--	--	--	--
24...	.45	21	--	60	100000	320000	--	250	40	20
24...	.39	23	--	62	--	300000	--	264	45	22
24...	.21	16	--	70	180000	--	15000	264	28	8
24...	.36	35	--	62	150000	--	120000	244	30	21
24...	.45	35	--	51	--	320000	100000	246	36	24
24...	.47	41	--	38	190000	150000	0	260	15	15
24...	.41	17	--	34	--	130000	20000	292	23	14
24...	.42	16	--	40	110000	45000	10000	272	26	17
24...	.43	15	--	--	--	--	--	314	24	13
JUN										
02...	.47	--	--	--	--	--	--	284	12	11
02...	.31	--	--	--	--	--	--	279	44	16
02...	.31	--	--	--	--	--	--	156	42	30
02...	.41	--	--	--	--	--	--	91	164	58
02...	.08	--	--	--	--	--	--	41	86	41
02...	.09	--	--	--	--	--	--	71	183	66
02...	.09	--	--	--	--	--	--	64	149	57
02...	.10	--	--	--	--	--	--	60	125	52
02...	.08	--	--	--	--	--	--	58	101	43
02...	.10	--	--	--	--	--	--	52	102	45
02...	.10	--	--	--	--	--	--	51	77	40
02...	.09	--	--	--	--	--	--	50	83	47
02...	.08	--	--	--	--	--	--	47	80	45
02...	.09	--	--	--	--	--	--	53	70	43
02...	.11	--	--	--	--	--	--	56	73	37
02...	.13	--	--	--	--	--	--	56	65	37
02...	.14	--	--	--	--	--	--	50	68	39
02...	.15	--	--	--	--	--	--	51	48	33
02...	.16	--	--	--	--	--	--	55	48	31
SEP										
27...	.09	15	>25	--	--	--	--	158	326	140
OCT										
04...	.59	9.6	3.7	--	--	--	--	454	13	13
05...	.43	18	6.2	--	--	--	--	384	10	10
06...	.39	--	--	--	--	--	--	355	142	58
06...	.93	41	>25	--	--	--	--	322	274	108
06...	13	48	>25	--	--	--	--	400	908	442
06...	1.7	42	49	--	--	--	--	237	556	190
06...	2.1	43	51	--	--	--	--	394	335	116

TABLE 45.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJFL- DAHL- GEN (N) (MG/L)
OCT								
06...	1140	73	.07	.02	.09	1.8	3.6	5.4
06...	1145	101	.02	.02	.04	1.7	3.7	5.4
06...	1150	163	.02	.01	.03	1.9	2.9	4.8
06...	1200	149	.01	.01	.02	1.1	2.2	3.3
06...	1205	71	.01	.00	.01	.78	3.9	4.7
06...	1210	60	.00	.01	.01	.71	3.4	4.1
06...	1215	52	.00	.01	.01	.48	4.2	4.7
06...	1220	40	.01	.00	.01	.50	4.0	4.5
06...	1225	34	.01	.00	.01	.55	3.8	4.3
06...	1235	36	.01	.00	.01	.48	2.4	2.9
06...	1255	60	.12	.15	.27	.45	2.5	2.9
06...	1305	71	.24	.09	.33	.42	2.2	2.6
06...	1320	50	.19	.10	.29	.32	1.7	2.0
06...	1330	55	.33	.08	.41	.40	2.0	2.4
06...	1340	38	.35	.06	.41	.32	1.2	1.5
06...	1350	27	.47	.05	.52	.26	1.4	1.7
06...	1405	14	.52	.05	.57	.34	1.4	1.7
06...	1420	11	.55	.03	.58	.60	1.5	2.1
06...	1435	7.4	.50	.08	.58	.36	1.4	1.8
06...	1450	4.8	.53	.09	.60	.44	1.7	2.1
06...	1515	2.6	.55	.07	.62	.06	1.5	1.6

DATE	TOTAL NITRO- GEN (N) (MG/L)	DIS- SOL- VED ORTHO- PHOS- PHORUS (P) (MG/L)	TOTAL ORTHO- PHOS- PHORUS (P) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDED ORGANIC CARBON (C) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL- NON- FILT- RABLE RESIDUE (MG/L)
OCT								
06...	5.5	.78	.63	49	--	205	400	156
06...	5.4	.74	.41	44	48	172	372	143
06...	4.8	.78	.50	37	--	142	311	96
06...	3.3	.39	.22	44	43	89	264	100
06...	4.7	.31	.13	38	30	80	210	88
06...	4.1	.34	.13	35	31	83	165	68
06...	4.7	.33	.13	38	26	84	137	56
06...	4.5	.39	.13	41	--	78	84	41
06...	4.3	.44	.15	38	20	74	111	45
06...	2.9	.47	.17	25	24	78	69	34
06...	3.2	.38	.15	30	26	68	76	35
06...	2.9	.45	.15	24	17	62	75	37
06...	2.3	.35	.15	--	--	57	114	44
06...	2.8	.35	.14	--	--	53	120	44
06...	1.9	.34	.14	--	--	52	137	57
06...	2.2	.37	.15	20	19	53	99	38
06...	2.3	.60	.25	--	--	59	80	33
06...	2.7	.68	.31	22	2.2	54	71	26
06...	2.4	.46	.21	--	--	62	67	30
06...	2.7	.38	.20	--	--	67	43	22
06...	2.2	.34	.17	25	27	77	66	32

TABLE 45.--NUTRIENT, BIOCHEMICAL OXYGEN DEMAND, COLIFORM BACTERIA, AND SOLIDS WATER-QUALITY DATA FOR STATION 06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER--CONTINUED

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	TIME	INSTANTANEOUS DTS- CHARGE (CFS)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL KJEL- DAHL NITRO- GEN (N) (MG/L)
FFR								
14...	0940	.41	.82	.78	1.6	1.7	2.6	4.3
14...	0950	.53	.65	.75	1.4	1.6	2.3	3.9
14...	1000	.81	.28	.36	.64	1.4	1.7	3.1
14...	1015	2.2	.52	.26	.79	1.3	1.9	3.2
14...	1030	5.9	.31	.22	.53	1.6	2.2	3.8
14...	1045	4.7	.26	.67	.93	1.2	3.6	4.8
14...	1100	9.5	1.0	.33	2.2	1.8	2.7	4.5
14...	1115	9.7	.80	.30	1.1	1.4	4.2	5.6
14...	1130	4.7	.27	.21	.49	1.5	2.3	3.8
14...	1145	4.4	.65	.32	.97	1.6	2.6	4.2
14...	1205	7.4	1.3	.53	1.8	1.3	3.2	4.5
14...	1230	5.9	1.1	.35	1.4	1.5	3.2	4.7
14...	1300	3.6	.59	.34	.93	1.5	3.0	4.5
14...	1330	2.4	.87	.43	1.3	1.6	2.1	3.7
14...	1400	2.0	.91	.39	1.3	1.8	2.4	4.2
14...	1430	1.8	.90	.40	1.3	1.8	2.8	4.6
14...	1500	1.8	.71	.49	1.2	1.6	2.7	4.3

DATE	TOTAL NITRO- GEN (N) (MG/L)	DTS- SOL- VED- PHOS- PHORUS (P) (MG/L)	TOTAL ORTHOPHOS- PHORUS (P) (MG/L)	DIS- SOL- VED ORGANIC CARBON (C) (MG/L)	SUS- PENDE ORGANIC CARBON (C) (MG/L)	DTS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
FFR								
14...	5.9	.74	.35	--	--	660	44	48
14...	5.3	.82	.47	--	--	579	44	46
14...	3.7	.91	.49	36	>25	792	62	58
14...	4.0	.57	.22	34	1.7	863	66	60
14...	4.3	.38	.19	44	15	1710	154	80
14...	5.7	.50	.15	45	>25	2010	144	132
14...	6.7	.64	.43	48	>25	1800	294	122
14...	6.7	.62	.40	42	>25	1570	300	142
14...	4.3	1.0	.41	40	21	1440	294	124
14...	5.2	.69	.39	44	16	1280	290	124
14...	6.3	.70	.34	40	14	1150	404	172
14...	6.1	.67	.37	36	14	1200	278	124
14...	5.4	.64	.29	41	9.8	1270	204	104
14...	5.0	.77	.42	41	10	1050	222	98
14...	5.5	1.0	.59	35	21	908	150	80
14...	5.9	1.3	.99	38	18	829	134	110
14...	5.5	1.4	.80	36	12	783	104	100

Trace Elements

Initially (May to November 1976), a rather complete suite of trace elements was analyzed. These comprehensive analyses were made to determine what trace elements were present in the runoff, what concentrations could be expected, and in what phase--particulate or dissolved--the trace elements occurred. Results of the analyses for the Littleton catchment area are presented in table 46 and for the Denver catchment area in table 47. Data are not available for the Lakewood catchment area.

TABLE 46.--COMPREHENSIVE TRACE-ELEMENT WATER-QUALITY DATA FOR STATION
06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON

[E indicates estimated]
WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	TOTAL ANTI- MONY (SB) (UG/L)	DIS- SOLVED ANTI- MONY (SB) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
APR 29....	2305	E6.6	--	--	1	--	0	--	--	--	2	--
JUL 19....	1840	10	0	0	9	10	1	70	10	90	4	24000

DATE	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL LITHIUM (LI) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
APR 29....	40	--	9	--	--	--	--	.0	.0	1	--	10
JUL 19....	190	1200	16	30	10	810	170	.3	.0	1	650	40

TABLE 47.--COMPREHENSIVE TRACE-ELEMENT WATER-QUALITY DATA FOR STATION
06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	TOTAL ANTI- MONY (SR) (UG/L)	DIS- SOLVED ANTI- MONY (SR) (JG/L)	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)
APR 25...	0010	.40	--	--	--	3	--	0	--	--
SEP 21...	1625	.50	0	0	--	6	10	1	100	0
OCT 04...	0715	.19	--	1	--	1	<10	1	110	140
06...	1130	18	3	0	50	20	<10	1	340	80

DATE	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL LITHIUM (LI) (UG/L)	DIS- SOLVED LITHIUM (LI) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)
APR 25...	--	6	--	80	--	13	--	--	--
SEP 21...	120	11	11000	230	1400	20	20	5	410
OCT 04...	30	16	240	90	<100	13	20	20	20
06...	280	--	12000	500	<100	42	10	0	400

DATE	DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL NICKEL (NI) (UG/L)	DIS- SOLVED NICKEL (NI) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
APR 25...	--	--	.0	--	--	--	0	--	50
SEP 21...	90	--	.0	--	--	1	1	870	100
OCT 04...	20	.0	.0	<50	3	--	--	90	50
06...	160	.2	.0	<50	6	--	--	1200	290

The results of the comprehensive analyses indicated that most of the trace elements did not occur at concentrations large enough to warrant inclusion in subsequent analyses. Arsenic, copper, iron, lead, and zinc were detected at sufficient concentrations to warrant inclusion in subsequent analysis. The results also indicated that the particulate phase was considerably more prevalent than the dissolved phase. Thus, total phases of arsenic, copper, iron, lead, and zinc (particulate plus dissolved phases) were determined in subsequent samples.

Based on the results of the comprehensive analyses, samples collected after February 1977 were analyzed for total concentrations of arsenic, copper, iron, lead, and zinc. Results of the analyses for the Littleton catchment area are presented in table 48, for the Lakewood catchment area in table 49, and for the Denver catchment area in table 50.

TABLE 48.--SELECTED TRACE-ELEMENT WATER-QUALITY DATA FOR STATION
06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON

[E indicates estimated, < indicates less than]

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	PH (UNITS)	TOTAL ARSENIC (AS) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL ZINC (ZN) (UG/L)
FEB								
14...	1050	E1.0	--	15	30	11000	1200	340
14...	1130	E.50	--	9	30	10000	1000	270
APR								
18...	1525	3.3	7.7	10	30	--	500	310
18...	1535	3.2	7.5	4	20	--	200	100
18...	1545	2.5	7.5	2	20	--	200	90
18...	1555	2.0	7.4	4	<10	--	200	90
18...	1605	1.9	7.5	7	20	--	300	180
18...	1615	1.7	7.5	6	20	--	300	170
18...	1625	1.5	7.5	6	20	--	300	150
JUN								
11...	1515	30	6.5	6	30	6400	400	180
11...	1525	61	6.6	9	60	20000	900	410
11...	1530	81	6.7	12	70	15000	800	370
11...	1535	91	6.8	10	70	16000	800	290
11...	1540	96	6.7	7	60	9200	500	240
11...	1545	90	6.7	6	30	7500	300	150
11...	1550	76	6.7	6	30	8600	400	180
11...	1555	60	6.7	4	20	5400	300	130
11...	1600	56	6.7	3	20	4300	200	110
11...	1605	44	6.8	6	30	6700	300	120
11...	1610	29	6.7	6	20	6000	300	130
11...	1615	21	6.8	4	20	5500	200	120
11...	1620	12	7.0	4	<10	4000	200	70
11...	1625	9.1	6.8	6	30	7900	200	120
11...	1630	7.0	7.0	3	20	3600	100	80
11...	1640	5.0	7.0	5	20	5100	200	100
11...	1650	4.1	6.9	3	40	3900	100	210
11...	1700	3.9	7.0	3	20	2800	100	80
11...	1710	3.4	7.2	3	20	2400	100	60

TABLE 49.--SELECTED TRACE-ELEMENT WATER-QUALITY DATA FOR STATION
06711635. NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	PH (UNITS)	TOTAL ARSENIC (AS) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL ZINC (ZN) (UG/L)
APR								
12...	1518	1.2	7.0	26	80	41000	800	960
12...	1522	2.4	7.2	--	120	62000	1000	1100
12...	1526	3.3	7.3	25	100	49000	900	810
12...	1530	3.1	7.4	20	90	39000	600	740
12...	1534	2.9	7.3	21	90	49000	700	700
12...	1538	2.6	7.4	30	80	49000	600	620
12...	1542	2.3	7.4	29	70	45000	600	540
12...	1546	2.2	7.4	24	70	41000	600	470
12...	1550	2.5	7.4	19	60	38000	500	450
12...	1554	2.5	7.5	20	60	42000	400	460
12...	1558	2.5	7.6	19	80	41000	500	440
12...	1602	2.3	7.5	20	60	35000	400	390
12...	1610	2.3	7.6	17	60	33000	300	370
12...	1618	2.5	7.3	16	60	36000	300	380
12...	1630	2.3	7.2	15	50	31000	400	350
12...	1650	2.0	7.2	15	40	26000	300	320
12...	1730	1.2	7.1	15	40	25000	300	330
12...	1800	.70	7.2	12	30	21000	300	280
12...	1830	.30	7.1	12	30	20000	300	280
19...	1410	1.0	8.1	15	70	--	800	670
19...	1415	1.3	8.0	17	70	--	700	550
19...	1425	1.5	8.1	18	80	--	600	480
19...	1435	1.7	8.3	14	60	--	500	390
19...	1445	2.0	8.3	14	50	--	400	400
19...	1455	2.3	8.2	15	50	--	400	330
19...	1505	3.1	8.4	12	60	--	400	360
19...	1520	2.8	8.5	12	50	--	300	270
19...	1535	3.3	8.5	10	40	--	400	260
19...	1550	2.9	8.5	10	40	--	300	230
19...	1605	2.6	8.4	8	40	--	200	220
19...	1620	2.6	8.6	7	40	--	300	230
19...	1635	2.6	8.5	6	30	--	200	200
19...	1650	2.3	8.6	7	30	--	200	200
19...	1705	2.5	8.6	6	30	--	200	180
19...	1720	2.0	8.4	8	20	--	200	200
19...	1735	1.7	8.4	6	20	--	200	190
19...	1750	1.6	8.3	8	40	--	200	200
19...	1805	1.9	8.3	7	30	--	200	210
19...	1820	2.5	8.3	9	30	--	200	190

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	PH (UNITS)	TOTAL ARSENIC (AS) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL ZINC (ZN) (UG/L)
APR							
19...	1835	2.9	8.1	6	30	100	150
19...	1850	3.3	8.3	8	40	200	200

TABLE 50.--SELECTED TRACE-ELEMENT WATER-QUALITY DATA FOR STATION
06714100 THIRTY-SIXTH STREET STORM SEWER AT DENVER

[< indicates less than]

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1977 TO DECEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	PH (UNITS)	TOTAL ARSENIC (AS) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	TOTAL ZINC (ZN) (UG/L)
FER								
14...	0940	.41	7.6	12	50	2900	200	450
14...	0950	.53	7.7	12	60	4400	200	470
14...	1030	5.9	7.1	17	160	5100	700	580
14...	1045	8.7	7.3	11	90	8800	900	630
14...	1100	9.5	7.1	6	80	8600	1000	700
14...	1130	8.7	7.7	14	100	8800	1000	720
14...	1145	8.4	7.5	14	130	8600	1000	700
14...	1230	5.9	7.9	12	210	8000	900	700
14...	1300	3.6	7.1	12	140	8800	800	660
14...	1400	2.0	7.2	19	60	4700	600	610
14...	1500	1.8	7.6	9	60	3100	400	550

Pesticides

Samples for analysis of pesticides were collected manually and analyzed in U.S. Geological Survey laboratories. Results of the analyses for the Littleton catchment area are presented in table 51, and for the Lakewood catchment area in table 52. Data are not available for the Denver catchment area.

TABLE 51.--PESTICIDE WATER-QUALITY DATA FOR STATION
06710200 BIG DRY CREEK TRIBUTARY AT LITTLETON

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

DATE	INSTANTANEOUS TIME (CFS)	TOTAL PCH (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DOT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
SEP 07.... 25....	1530 0812	15 20	.0 .0	.00 .00	1.7 .1	.00 .00	.02 .00	.00 .00	.78 .24	.00 .00	.00 .00
SFP 07.... 25....	.26 .00	.04 .00	.05 .01	3.5 .13	.00 .00	.00 .00	.00 .00	0 .00	7.5 .40	.00 .04	3.2 .14

TABLE 52.--PESTICIDE WATER-QUALITY DATA FOR STATION
06711635 NORTH AVENUE STORM DRAIN AT DENVER FEDERAL CENTER, AT LAKEWOOD

[E indicates estimated]

WATER QUALITY DATA. CALENDAR YEAR JANUARY 1976 TO DECEMBER 1976

	INSTAN- TANEOUS	DIS- CHARGE (CFS)	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL D1- AZINON (UG/L)	TOTAL D1- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
SEP 14....	1452	E3.4	.0	.00	.1	.00	.00	.00	.08	.01	.00	.00
SEP 14....	.00	.00	.04	.00	.00	.00	.00	0	.00	.04	.00	.00
DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)

DATA FOR USE WITH STORM WATER MANAGEMENT MODEL II

Data required to model various aspects of urban runoff in the three study areas using the U.S. Environmental Protection Agency's Storm Water Management Model II (Huber and others, 1975) were obtained from aerial photographs and topographic, drainage, and sewer-system maps. Data on subcatchment areas, street gutters, and sewer systems for the Littleton catchment area are presented in tables 53-54 and on figure 3, for the Lakewood catchment area in tables 55-56 and on figure 4, and for the Denver catchment area in tables 57-58 and on plate 3. Transport data for the Denver catchment area are presented in table 59. Transport data for the Littleton and Lakewood catchment areas are not required for the model.

Table 53.--*Subcatchment data for Littleton catchment area for use with Storm Water Management Model II*

Sub-catchment no.	Gutter or pipe no. for sub-catchment	Sub-catchment area (acres)	Width (ft)	Percent effective impervious	Slope	Land use ¹	Number of catch-basins	Total length of gutters ²
1	20	115	7,000	4.6	0.035	U	0	71.4
2	21	28	600	21	.028	S	0	84.9
3	24	96	2,500	26	.033	S	2	310
4	22	15	950	5.4	.032	U	0	17.3
5	23	13	1,520	20	.029	S	0	41.3
6	26	43	1,750	27	.017	S	2	131
7	31	72	6,400	0	.044	U	0	0
8	25	65	2,430	24	.023	S	1	236
9	27	75	3,350	26	.035	S	6	284
10	27	59	3,350	21	.032	S	5	191
11	29	17	910	32	.036	S	1	74.2
12	32	8.5	920	19	.070	S	2	24.0

¹S, single-family residential; U, undeveloped.

²In hundreds of feet; for example, 71.4 indicates 7,140 feet.

Table 54.--*Gutter or pipe data for Littleton catchment area for use with Storm Water Management Model II*

Gutter or pipe	Gutter or pipe for drain- age	Geo- metry ¹	Bottom width of gutter or pipe diameter (ft)	Length (ft)	Slope, in foot per foot			Material type ²	Manning <i>n</i> value
					Invert	Left- hand side	Right- hand side		
20	21	T	50	3,500	0.020	44	50	NAT	0.040
21	22	T	5.0	600	.021	3.5	3.5	NAT	.040
22	23	T	6.0	950	.021	1.7	2.8	NAT	.040
23	27	T	50	1,520	.012	1.0	1.4	NAT	.040
24	27	T	2.0	2,500	.017	0	55	AP	.013
25	27	T	2.0	2,430	.010	0	40	AP	.013
26	27	T	1.5	1,750	.014	0	34	AP	.013
27	28	C	4.5	3,350	.018	----	----	RCP	.016
28	30	C	6.0	400	.015	----	----	CMP	.024
29	30	T	2.0	910	.026	0	32	AP	.013
30	32	T	1.0	600	.025	10	10	NAT	.040
31	32	T	20	3,200	.035	7.5	3.0	NAT	.040
32	--	T	1.0	460	.020	2.0	2.0	NAT	.040

¹C, circular; T, triangular.

²AP, asphalt pavement; CMP, corrugated metal pipe; RCP, reinforced concrete pipe; NAT, natural.

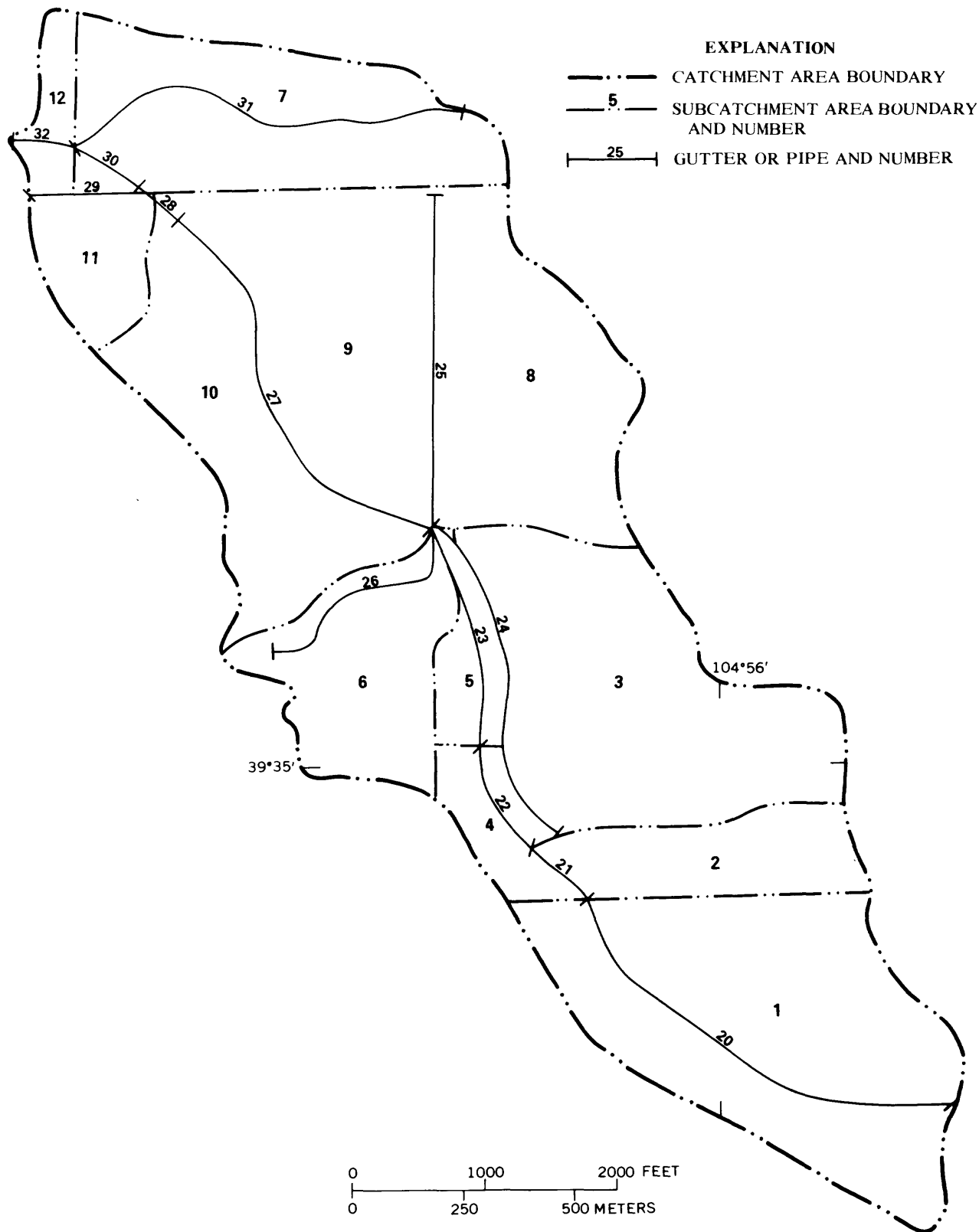


Figure 3.--Features related to use of Storm Water Management Model II for the catchment area in Littleton drained by tributary to Big Dry Creek.

Table 55.--Subcatchment data for Lakewood catchment area for use with Storm Water Management Model II

Sub-catchment no.	Gutter or pipe no. for sub-catchment	Sub-catchment area (acres)	Width (ft)	Percent effective impervious	Slope	Land use ¹	Number of catch-basins	Total length of gutters ²
1	10	9.5	900	12	0.090	U	2	27.5
2	12	9.4	805	41	.045	M	3	34.0
3	12	9.3	805	35	.030	M	1	36.8
4	13	7.0	585	48	.070	M	2	46.7
5	20	6.5	305	17	.045	U	0	3.0
6	15	14	490	52	.045	C	3	24.8
7	21	21	1,070	12	.050	U	2	23.2

¹C, commercial; M, multifamily residential; U, undeveloped.

²In hundreds of feet; for example, 27.5 indicates 2,750 feet.

Table 56.--Gutter or pipe data for Lakewood catchment area for use with Storm Water Management Model II

Gutter or pipe	Gutter or pipe for drainage	Geo-metry ¹	Bottom width of gutter or pipe diameter (ft)	Length (ft)	Slope, in foot per foot			Material type ²	Manning n value
					Invert	Left-hand side	Right-hand side		
10	11	T	2.0	900	0.030	0	34	AP	0.013
11	12	T	1.7	195	.055	.6	.6	NAT	.040
12	18	T	2.0	805	.035	0	16	AP	.013
13	14	T	2.0	585	.009	0	42	AP	.013
14	16	T	1.0	1,025	.030	.4	.4	NAT	.040
15	16	T	2.0	305	.002	0	19	AP	.013
16	17	C	2.5	490	.006	----	----	RCP	.016
17	21	C	2.5	70	.008	----	----	RCP	.016
18	19	C	3.0	590	.035	----	----	CMP	.024
19	21	C	3.5	235	.035	----	----	CMP	.024
20	21	T	2.0	1,070	.006	0	21	AP	.013
21	--	C	4.5	460	.025	----	----	CMP	.024

¹C, circular; T, trapezoidal.

²AP, asphalt pavement; CMP, corrugated metal pipe; RCP, reinforced concrete pipe; NAT, natural.

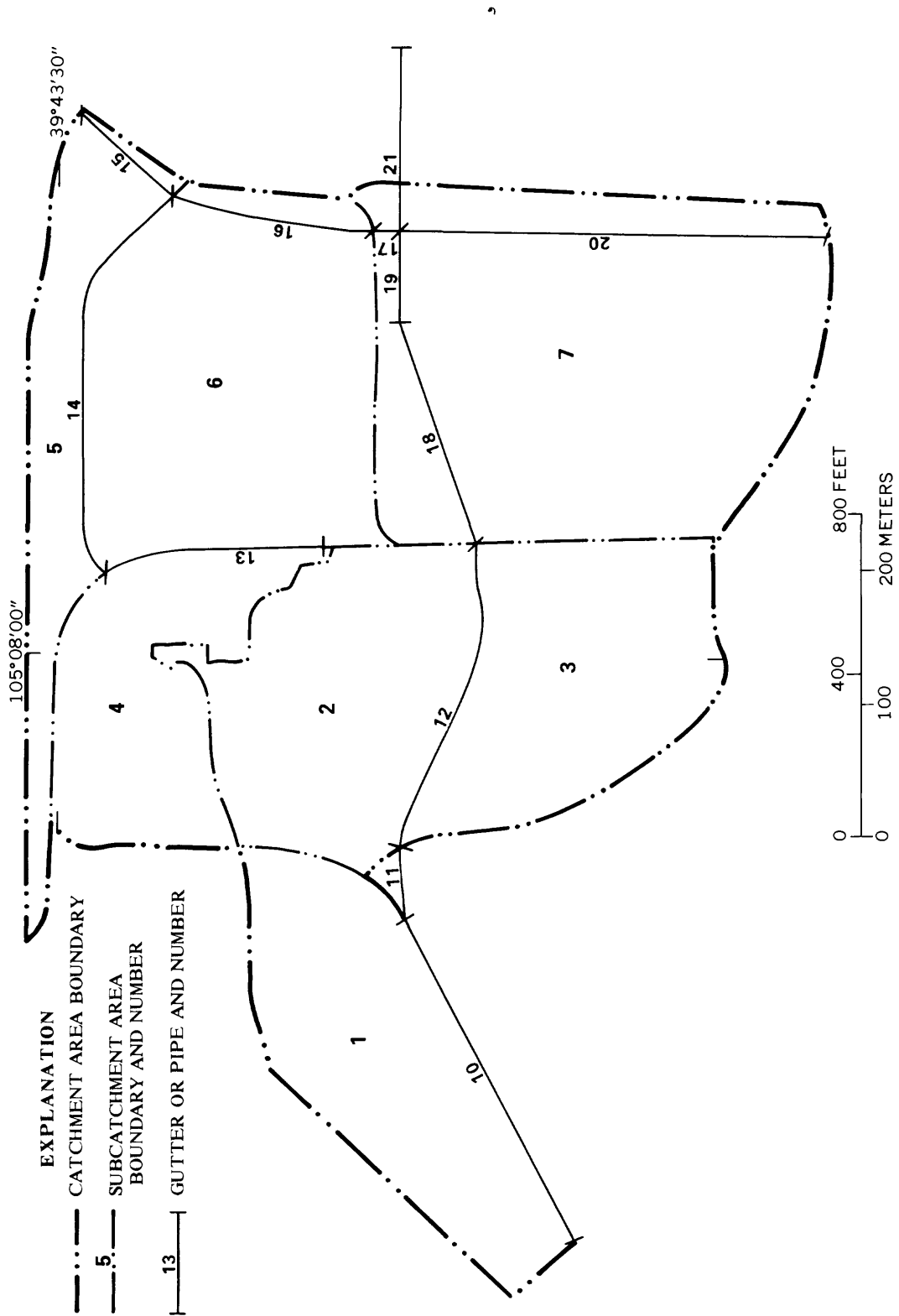


Figure 4.--Features related to use of Storm Water Management Model II for the catchment area in Lakewood drained by North Avenue Storm Drain.

Table 57.--Subcatchment data for Denver catchment area for use with Storm Water Management Model II

Sub-catchment no.	Gutter or pipe no. for sub-catchment	Sub-catchment area (acres)	Width (ft)	Percent effective impervious	Slope	Land use ¹	Number of catch-basins	Total length of gutters ²
1	1	69	2,400	30	0.027	S	35	170
2	3	34	2,300	31	.022	S	20	96.0
3	11	25	650	8	.025	U	9	21.6
4	12	28	1,200	14	.025	U	14	36.0
5	30	66	4,500	20	.011	S	31	162
6	33	29	1,330	30	.015	S	16	72.0
7	31	23	700	25	.014	S	13	70.8
8	34	75	3,700	35	.010	M	36	202
9	5	40	2,360	28	.021	S	24	114
10	7	37	2,420	83	.017	C	29	73.2
11	14	27	1,700	35	.020	S	15	72.0
12	69	27	1,650	45	.012	M	18	81.6
13	35	20	1,400	49	.005	M	15	57.0
14	36	20	1,380	46	.009	M	17	60.0
15	37	28	1,360	45	.004	M	15	87.0
16	38	26	600	96	.002	C	19	85.0
17	74	27	1,000	89	.004	C	19	79.2
18	71	31	2,400	66	.017	M	22	86.5
19	73	47	1,200	78	.009	C	37	147
20	65	12	720	75	.011	C	7	27.2
21	155	8	35	70	.015	C	6	23.9
22	102	44	1,800	48	.023	C	26	130
23	9	41	2,200	29	.015	C	20	75.1
24	20	39	905	24	.015	S	14	103
25	10	28	2,130	44	.008	S	15	67.2
26	22	42	2,630	31	.015	S	22	112
27	24	25	1,325	28	.007	S	13	61.8
28	26	11	1,090	21	.005	S	10	28.8
29	28	25	1,750	24	.019	S	19	60.0
30	15	20	980	37	.010	M	9	48.1
31	75	24	890	35	.003	M	13	63.5
32	130	30	450	53	.007	M	18	69.6
33	39	19	1,070	85	.010	C	12	52.8
34	66	19	1,030	97	.005	C	12	56.4
35	67	17	1,360	97	.022	C	15	51.6

Table 57.--*Subcatchment data for Denver catchment area for use with Storm Water Management Model II--Continued*

Sub-catchment no.	Gutter or pipe no. for sub-catchment	Sub-catchment area (acres)	Width (ft)	Percent effective impervious	Slope	Land use ¹	Number of catch-basins	Total length of gutters ²
36	68	15	1,100	96	0.005	C	4	36.0
37	128	30	1,110	32	.014	U	22	86.4
38	131	8	900	97	.010	C	4	19.2
39	16	46	2,120	55	.006	C	24	117
40	17	27	1,470	67	.008	C	16	74.7
41	18	16	1,470	37	.013	S	14	51.0
42	76	50	1,000	33	.012	S	27	148
43	40	20	1,000	20	.003	S	14	52.2
44	19	17	1,400	22	.010	S	14	46.2
45	41	38	2,800	21	.018	S	29	98.5
46	42	30	2,450	24	.014	S	26	80.0
47	77	27	1,000	26	.011	S	18	84.0
48	43	24	2,080	22	.099	S	20	63.6
49	44	22	1,740	21	.014	S	18	39.6
50	45	23	1,750	30	.010	S	18	55.2
51	46	25	1,740	28	.012	S	16	67.0
52	54	15	1,010	17	.007	S	11	39.6
53	47	10	700	26	.016	S	9	27.6
54	48	14	700	23	.007	S	11	34.8
55	56	15	990	19	.006	S	11	42.0
56	49	18	700	22	.002	S	13	45.6
57	58	17	1,010	16	.007	S	11	37.4
58	50	11	680	47	.003	C	8	36.0
59	60	14	1,010	44	.006	S	7	49.8
60	78	25	1,340	79	.005	C	16	63.0
61	80	24	1,780	90	.003	C	22	63.6
62	81	16	1,650	40	.003	S	14	45.6
63	82	22	1,380	24	.002	S	73	59.4
64	83	13	1,050	25	.002	S	12	36.0
65	84	9	1,040	33	.002	S	10	25.1
66	85	20	1,350	32	.002	S	18	48.0
67	86	19	1,660	30	.003	S	18	28.8
68	87	15	990	38	.002	S	12	37.2
69	88	10	650	21	.003	S	10	29.3
70	89	22	1,360	65	.003	C	17	52.8

Table 57.--Subcatchment data for Denver catchment area for use with Storm Water Management Model II--Continued

Sub-catchment no.	Gutter or pipe no. for sub-catchment	Sub-catchment area (acres)	Width (ft)	Percent effective impervious	Slope	Land use ¹	Number of catch-basins	Total length of gutters ²
71	91	21	1,360	69	0.004	C	15	55.2
72	93	19	1,440	41	.003	C	17	39.0
73	94	43	1,410	45	.004	C	36	112
74	95	14	1,400	32	.002	S	14	42.1
75	96	25	1,400	28	.002	C	19	60.0
76	97	22	1,800	32	.004	C	18	51.6
77	98	18	1,800	24	.006	C	17	45.5
78	504	17	1,400	41	.004	C	17	44.4
79	500	17	1,400	29	.004	C	17	42.0
80	99	14	1,880	48	.022	C	8	42.0
81	501	22	1,400	34	.002	C	20	61.2
82	502	16	1,030	32	.003	C	15	38.5
83	51	11	700	44	.003	S	10	28.7
84	62	14	990	23	.008	S	10	42.0
85	52	12	670	20	.006	S	8	34.8
86	63	16	990	20	.007	S	12	43.7
87	53	10	670	25	.006	S	8	20.4
88	64	15	1,010	38	.003	S	11	37.2
89	160	38	4,200	27	.004	S	26	98.5
90	164	18	1,300	29	.004	C	9	49.0
91	164	15	1,000	28	.002	C	14	41.9
92	165	10	1,100	25	.002	C	9	22.8
93	166	29	1,700	34	.002	I	14	78.0

¹S, single-family residential; M, multifamily residential; C, commercial; I, industrial; U, undeveloped.

²In hundreds of feet; for example, 170 indicates 17,000 feet.

Table 58.--Gutter or pipe data for Denver catchment area
for use with Storm Water Management Model II

Gutter or pipe	Pipe or inlet for drain- age	Geo- metry ¹	Bottom width of gutter or pipe diameter (ft)	Height (ft)	Length (ft)	Invert slope	Material type ²	Manning <i>n</i> value
1	2	C	1.5	----	1,660	0.011	RCP	0.016
2	4	C	2.2	----	1,280	.020	RCP	.016
3	4	C	2.0	----	2,300	.011	RCP	.016
4	6	C	2.5	----	590	.016	RCP	.016
5	6	C	1.7	----	2,360	.009	RCP	.016
6	8	C	2.7	----	550	.018	RCP	.016
7	8	C	1.8	----	2,420	.008	RCP	.016
8	101	C	2.7	----	620	.017	BR	.016
9	101	C	1.8	----	1,400	.013	RCP	.016
10	103	C	4.0	----	1,070	.005	BR	.016
11	13	C	1.8	----	650	.005	RCP	.016
12	13	C	2.0	----	1,200	.007	RCP	.016
13	154	C	2.0	----	550	.027	RCP	.016
14	154	C	1.4	----	980	.013	RCP	.016
15	104	C	1.1	----	980	.012	RCP	.016
16	104	C	1.9	----	1,720	.014	RCP	.016
17	105	C	1.4	----	1,470	.021	RCP	.016
18	106	C	1.3	----	1,470	.019	RCP	.016
19	107	C	1.3	----	1,400	.017	RCP	.016
20	21	C	1.3	----	880	.007	RCP	.016
21	23	C	1.8	----	600	.014	RCP	.016
22	23	C	1.6	----	1,370	.008	RCP	.016
23	25	C	2.5	----	790	.005	BR	.016
24	25	C	1.8	----	1,050	.013	RCP	.016
25	27	C	2.8	----	780	.007	RCP	.016
26	27	C	1.5	----	970	.006	RCP	.016
27	29	C	2.8	----	450	.010	BR	.016
28	29	C	1.5	----	1,060	.010	RCP	.016
29	508	C	2.8	----	660	.009	BR	.016
30	505	C	1.0	----	1,650	.010	RCP	.016
31	32	C	1.4	----	660	.008	RCP	.016
32	506	C	1.8	----	1,120	.010	RCP	.016
33	506	C	0.8	----	1,330	.025	RCP	.016
34	119	R	4.3	2.83	2,660	.005	BR	.016
35	120	C	1.5	----	1,400	.013	RCP	.016

Table 58.--Gutter or pipe data for Denver catchment area
for use with Storm Water Management Model II--Continued

Gutter or pipe	Pipe or inlet for drain- age	Geo- metry ¹	Bottom width of gutter or pipe diameter (ft)	Height (ft)	Length (ft)	Invert slope	Material type ²	Manning <i>n</i> value
36	121	C	1.5	----	1,380	0.012	RCP	0.016
37	122	C	1.4	----	1,370	.010	RCP	.016
38	123	C	1.5	----	370	.008	RCP	.016
39	124	C	1.5	----	1,070	.006	RCP	.016
40	508	C	1.4	----	710	.012	RCP	.016
41	108	C	3.5	----	2,800	.006	RCP	.016
42	109	C	1.6	----	2,100	.011	RCP	.016
43	110	C	1.3	----	2,080	.013	RCP	.016
44	111	C	1.5	----	1,740	.008	RCP	.016
45	112	C	1.5	----	1,730	.006	RCP	.016
46	113	C	1.5	----	1,740	.006	RCP	.016
47	114	C	1.3	----	870	.010	RCP	.016
48	115	C	1.5	----	730	.008	RCP	.016
49	143	C	1.3	----	820	.011	RCP	.016
50	156	C	1.3	----	700	.006	RCP	.016
51	157	C	1.3	----	720	.007	RCP	.016
52	158	C	1.0	----	710	.011	RCP	.016
53	159	C	1.0	----	670	.019	RCP	.016
54	55	C	1.3	----	1,050	.004	RCP	.016
55	57	C	1.5	----	450	.012	RCP	.016
56	57	C	1.3	----	900	.005	RCP	.016
57	59	C	1.8	----	470	.010	RCP	.016
58	59	C	1.3	----	1,050	.009	RCP	.016
59	61	R	3.0	2.0	460	.003	BR	.016
60	61	C	1.3	----	1,010	.007	RCP	.016
61	161	R	3.0	2.0	460	.005	BR	.016
62	161	C	1.4	----	990	.005	RCP	.016
63	162	C	1.4	----	990	.004	RCP	.016
64	163	C	1.4	----	1,040	.004	RCP	.016
65	27	C	1.4	----	720	.026	RCP	.016
66	125	C	1.5	----	1,030	.009	RCP	.016
67	126	C	1.4	----	1,400	.009	RCP	.016
68	127	C	1.0	----	340	.015	RCP	.016
69	70	C	1.3	----	1,650	.015	RCP	.016
70	72	C	2.2	----	540	.015	RCP	.016

Table 58.--Gutter or pipe data for Denver catchment area
for use with Storm Water Management Model II--Continued

Gutter or pipe	Pipe or inlet for drain- age	Geo- metry ¹	Bottom width of gutter or pipe diameter (ft)	Height (ft)	Length (ft)	Invert slope	Material type ²	Manning <i>n</i> value
71	72	C	1.5	----	1,320	0.014	RCP	0.016
72	132	C	2.5	----	1,210	.014	RCP	.016
73	132	C	1.6	----	1,180	.020	RCP	.016
74	132	C	1.4	----	1,000	.008	RCP	.016
75	130	C	1.6	----	890	.008	RCP	.016
76	129	C	1.3	----	1,000	.016	RCP	.016
77	133	C	1.3	----	980	.013	RCP	.016
78	79	C	1.6	----	1,340	.013	RCP	.016
79	134	C	2.5	----	480	.003	RCP	.016
80	134	C	1.6	----	1,380	.016	RCP	.016
81	135	C	1.5	----	1,410	.014	RCP	.016
82	136	C	1.5	----	1,380	.014	RCP	.016
83	137	C	1.4	----	1,040	.010	RCP	.016
84	138	R	6.3	4.17	1,010	.006	RCP	.016
85	139	C	1.5	----	1,370	.017	RCP	.016
86	140	C	1.4	----	1,660	.011	RCP	.016
87	141	C	1.5	----	990	.009	RCP	.016
88	142	C	1.1	----	650	.007	RCP	.016
89	90	C	1.5	----	1,400	.007	RCP	.016
90	92	C	2.0	----	500	.008	RCP	.016
91	92	C	1.6	----	1,400	.008	RCP	.016
92	507	C	2.5	----	510	.006	BR	.016
93	507	C	1.6	----	1,440	.010	RCP	.016
94	145	C	1.8	----	1,410	.012	RCP	.016
95	146	C	1.8	----	1,400	.009	RCP	.016
96	147	C	2.1	----	1,380	.008	BR	.016
97	148	C	1.8	----	1,400	.013	RCP	.016
98	149	C	1.6	----	1,400	.013	RCP	.016
99	503	C	1.3	----	970	.006	RCP	.016
500	151	C	1.6	----	1,390	.014	RCP	.016
501	152	C	1.7	----	1,400	.014	RCP	.016
502	153	C	1.4	----	1,030	.018	RCP	.016
503	150	C	2.0	----	310	.003	RCP	.016
504	150	C	1.6	----	1,400	.015	RCP	.016
505	174	C	3.4	----	550	.004	RCP	.016

Table 58.--Gutter or pipe data for Denver catchment area
for use with Storm Water Management Model II--Continued

Gutter or pipe	Pipe or inlet for drain- age	Geo- metry ¹	Bottom width of gutter or pipe diameter (ft)	Height (ft)	Length (ft)	Invert slope	Material type ²	Manning <i>n</i> value
506	174	C	2.5	----	360	0.006	RCP	0.016
507	145	C	2.5	----	960	.007	RCP	.016
508	171	C	2.5	----	360	.004	RCP	.016

¹C, circular; R, rectangular.

²RCP, reinforced concrete pipe; BR, brick.

Table 59.--Transport data for Denver catchment area
for use with Storm Water Management Model II

Sewer element	Up- stream sewer or inlet	Geo- metry ¹	Diameter (ft)	Height (ft)	Width (ft)	Length (ft)	Invert slope	Material type ²	Manning <i>n</i> value
201	101	C	3.3	---	---	690	0.013	BR	0.016
202	102	C	4.0	---	---	400	.012	BR	.016
203	173	C	4.2	---	---	1,220	.005	BR	.016
204	154	C	3.0	---	---	1,200	.008	BR	.016
205	155	R	---	2.0	3.0	550	.021	BR	.016
206	103	R	---	4.0	6.0	1,150	.004	BR	.016
207	104	R	---	4.0	6.0	670	.005	RCP	.016
208	170	R	---	3.5	5.3	600	.018	BR	.016
209	105	R	---	3.5	5.3	450	.011	BR	.016
210	106	R	---	3.5	5.3	430	.011	BR	.016
211	107	R	---	3.5	5.3	430	.011	RCP	.016
213	171	C	3.5	---	---	620	.006	BR	.016
214	172	R	---	3.0	4.5	1,700	.006	BR	.016
215	108	C	5.0	---	---	450	.008	BR	.016
216	109	C	5.0	---	---	450	.008	BR	.016
217	110	C	5.2	---	---	450	.008	BR	.016
218	111	C	5.2	---	---	450	.007	RCP	.016
219	112	C	5.3	---	---	450	.007	BR	.016
220	113	C	5.3	---	---	470	.007	RCP	.016
221	114	C	5.3	---	---	440	.007	BR	.016
222	115	C	5.3	---	---	460	.007	BR	.016
223	143	C	5.3	---	---	150	.006	BR	.016
224	132	R	---	3.0	4.5	1,830	.006	RCP	.016
225	130	R	---	3.0	4.5	1,130	.014	RCP	.016
226	179	R	---	3.0	4.5	400	.010	RCP	.016
227	180	R	---	3.0	4.5	450	.013	RCP	.016
230	174	R	---	2.8	4.3	2,300	.004	RCP	.016
233	119	R	---	2.8	4.3	610	.007	RCP	.016
234	120	R	---	2.8	4.3	550	.007	RCP	.016
235	121	R	---	2.8	4.3	530	.008	RCP	.016
236	122	R	---	2.8	4.3	620	.010	RCP	.016
237	177	R	---	3.3	5.0	1,150	.004	RCP	.016
238	123	R	---	3.3	5.0	560	.004	RCP	.016
239	124	R	---	3.3	5.0	600	.008	RCP	.016
240	125	R	---	3.3	4.9	480	.014	RCP	.016

Table 59.--Transport data for Denver catchment area
for use with Storm Water Management Model II--Continued

Sewer ele- ment	Up- stream sewer or inlet	Geo- metry ¹	Diameter (ft)	Height (ft)	Width (ft)	Length (ft)	Invert slope	Material type ²	Manning <i>n</i> value
241	126	R	---	3.3	4.9	460	0.010	RCP	0.016
242	127	R	---	3.3	4.9	600	.008	RCP	.016
243	178	R	---	3.3	4.9	520	.007	RCP	.016
244	128	R	---	3.3	4.9	1,170	.007	RCP	.016
245	129	R	---	3.8	5.6	980	.010	RCP	.016
246	133	R	---	4.2	6.3	1,070	.006	RCP	.016
247	134	C	3.3	---	---	430	.003	RCP	.016
248	135	C	3.8	---	---	510	.003	RCP	.016
249	136	R	---	3.5	5.3	480	.003	RCP	.016
250	137	R	---	3.5	5.3	520	.004	RCP	.016
251	138	R	---	5.0	7.5	470	.003	RCP	.016
252	139	R	---	5.0	7.5	500	.003	RCP	.016
253	140	R	---	5.0	7.5	480	.003	RCP	.016
254	141	R	---	5.0	7.5	480	.003	RCP	.016
255	142	R	---	5.0	7.5	980	.003	RCP	.016
256	181	C	6.8	---	---	300	.006	BR	.016
257	156	C	6.8	---	---	450	.005	BR	.016
258	157	C	6.8	---	---	450	.005	BR	.016
259	158	C	6.8	---	---	440	.005	BR	.016
260	159	C	6.8	---	---	400	.005	BR	.016
261	161	R	---	2.3	4.4	460	.003	RCP	.016
262	162	R	---	2.3	4.4	450	.004	RCP	.016
263	163	R	---	2.5	3.8	400	.003	RCP	.016
264	160	R	---	2.5	3.8	630	.004	BR	.016
265	183	R	---	2.0	3.0	380	.019	BR	.016
266	184	R	---	2.0	3.0	25	.337	BR	.016
267	185	C	6.8	---	---	220	.005	BR	.016
268	164	C	6.8	---	---	380	.007	BR	.016
269	165	C	6.8	---	---	1,020	.007	BR	.016
272	145	R	---	3.3	4.9	480	.004	BR	.016
273	146	R	---	3.5	5.3	480	.002	BR	.016
274	147	R	---	3.5	5.3	480	.002	BR	.016
275	148	R	---	3.5	5.3	480	.004	BR	.016
276	149	R	---	3.5	5.3	480	.004	BR	.016
277	150	R	---	4.0	6.0	480	.002	BR	.016

Table 59.--Transport data for Denver catchment area
for use with Storm Water Management Model II--Continued

Sewer ele- ment	Up- stream sewer or inlet	Geo- metry ¹	Diameter (ft)	Height (ft)	Width (ft)	Length (ft)	Invert slope	Material type ²	Manning <i>n</i> value
278	151	R	---	4.0	6.0	520	0.002	BR	0.016
279	152	R	---	4.0	6.0	450	.003	BR	.016
280	153	R	---	4.0	6.0	1,000	.003	BR	.016
281	131	C	1.6	---	---	890	.008	RCP	.016
282	166	C	6.8	---	---	750	.007	BR	.016
283	186	C	8.0	---	---	48	.080	BR	.016
284	187	C	14.0	---	---	16	.080	BR	.016
285	188	C	20.0	---	---	40	.080	BR	.016
286	189	C	8.0	---	---	62	.007	BR	.016

¹C, circular; R, rectangular.

²RCP, reinforced concrete pipe; BR, brick.

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