# CHANNEL-BED DEGRADATION IN MAJOR OKLAHOMA STREAMS

## VOLUME III of V: NORTH CANADIAN RIVER

**Final Report**
**ODOT Item Number 2191**

**by**

**A. K. Tyagi, Ph.D., P.E.**
**Director**

**and**

**Pratima Poudyal**
**Research Associate**

**Oklahoma Infrastructure Consortium**

**School of Civil and Environmental Engineering**

**Oklahoma State University**

**Stillwater, OK 74078**

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15. Abstract

The purpose of this research is to analyze the flowline data and relate it to the degradation of the river bed at bridge locations in the river. This information may then be used to replace or rehabilitate those bridges that experienced severe degradation.

This report evaluates channel degradation in 463.85-mile reach of North Canadian River in Oklahoma. In this study, the 463.85 mile river length is divided into three Reaches: Reach 1- river station (RS) 1 (Bridge Key 16523) to Canton Dam, Reach 2- Canton Dam to Overholser Dam, and Reach 3- Overholser Dam to river station (RS) 40 (Bridge Key b15585). The flowlines of North Canadian River in Oklahoma were observed over a long period. RS 2 in reach 1 shows the maximum degradation of 4.63 feet from 1965 to 2000. In reach 2, RS 9 shows the maximum degradation of 5.83 feet in 58 years. Similarly, in reach 3, RS 33 shows the maximum degradation of 17.67 feet in 38 years. The maximum aggradation of 9.75 in 20 years is observed at RS 21.

The North Canadian River in Oklahoma has experienced degradation over 10 feet at three river stations which have been serving more then 10 years. River station (RS 23) at S.H. 270, RS 33 at I-40, and RS 39 at S.H. 84 have experienced degradation of 15.6 feet in 11 years, 17.67 feet in 38 years, and 15.0 feet in 47 years, respectively. These bridges are defined as critical and recommended for rehabilitation or replacement in the replacement cycle. A detailed hydraulic and geotechnical analysis should be performed before reconstruction.

It is recommended that degradation of tributaries is evaluated to determine the structures where flowline is severely degrading in North Canadian River basin.

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# SI (METRIC) CONVERSION FACTORS

## *Approximate Conversions to SI Units*

| Symbol | When you know | Multiply by | To Find | Symbol |
|---|---|---|---|---|
| | **LENGTH** | | | |
| in | inches | 25.40 | millimeters | mm |
| ft | feet | 0.3048 | meters | m |
| yd | yards | 0.9144 | meters | m |
| mi | miles | 1.609 | kilometers | km |
| | **AREA** | | | |
| $in^2$ | square inches | 645.2 | square millimeters | $mm^2$ |
| $ft^2$ | square feet | 0.0929 | square meters | $m^2$ |
| $yd^2$ | square yards | 0.8361 | square meters | $m^2$ |
| ac | acres | 0.4047 | hectacres | ha |
| $mi^2$ | square miles | 2.590 | square kilometers | $km^2$ |
| | **VOLUME** | | | |
| fl oz | fluid ounces | 29.57 | milliliters | mL |
| gal | gallon | 3.785 | liters | L |
| $ft^3$ | cubic feet | 0.0283 | cubic meters | $m^3$ |
| $yd^3$ | cubic yards | 0.7645 | cubic meters | $m^3$ |
| | **MASS** | | | |
| oz | ounces | 28.35 | grams | g |
| lb | pounds | 0.4536 | kilograms | kg |
| T | short tons (2000 lb) | 0.907 | megagrams | Mg |
| | **TEMPERATURE (exact)** | | | |
| °F | degrees Fahrenheit | (°F-32)/1.8 | degrees Celsius | °C |
| | **FORCE and PRESSURE or STRESS** | | | |
| lbf | poundforce | 4.448 | Newtons | N |
| $lbf/in^2$ | poundforce per square inch | 6.895 | kilopascals | kPa |

## *Approximate Conversions from SI Units*

| Symbol | When you know | Multiply by | To Find | Symbol |
|---|---|---|---|---|
| | **LENGTH** | | | |
| mm | millimeters | 0.0394 | inches | in |
| m | meters | 3.281 | feet | ft |
| m | meters | 1.094 | yards | yds |
| km | kilometers | 0.6214 | miles | mi |
| | **AREA** | | | |
| $mm^2$ | square millimeters | 0.00155 | square inches | $in^2$ |
| $m^2$ | square meters | 10.764 | square feet | $ft^2$ |
| $m^2$ | square meters | 1.196 | square yards | $yd^2$ |
| ha | hectacres | 2.471 | acres | ac |
| $km^2$ | square kilometers | 0.3861 | square miles | $mi^2$ |
| | **VOLUME** | | | |
| mL | milliliters | 0.0338 | fluid ounces | fl oz |
| L | liters | 0.2642 | gallon | gal |
| $m^3$ | cubic meters | 35.315 | cubic feet | $ft^3$ |
| $m^3$ | cubic meters | 1.308 | cubic yards | $yd^3$ |
| | **MASS** | | | |
| g | grams | 0.0353 | ounces | oz |
| kg | kilograms | 2.205 | pounds | lb |
| Mg | megagrams | 1.1023 | short tons (2000 lb) | T |
| | **TEMPERATURE (exact)** | | | |
| °C | degrees Fahrenheit | 9/5(°C)+32 | degrees Celsius | °F |
| | **FORCE and PRESSURE or STRESS** | | | |
| N | Newtons | 0.2248 | poundforce | lbf |
| kPa | kilopascals | 0.1450 | poundforce per square inch | $lbf/in^2$ |

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# I. INTRODUCTION

Natural alluvial rivers generally do not exist in equilibrium. The fluvial process in an alluvial river is a dynamic process, a function of flow and sediment regimes interacting with the physiographic features and vegetative cover of the landscape (Ward and Standford 2006). Streams are not inherently unstable but they are often out of equilibrium due to imposed conditions. Man made activities and natural events are the major factors which disturb the stability of a river, causing high sediment load, high slope, relatively coarse grain size, high lateral mobility rate, and multi-thread, braided stream. If the streambed is eroded, resulting in a low bed elevation it is called “degradation” and if bed elevation is elevated due to an accumulation of sediment it is called “aggradation”.

A river channel is considered stable if the streambed does not change its dimension, pattern and profile over a relatively long river reach and long period of time. If the hydraulic, hydrologic, and sedimentological characteristics of the alluvial rivers are altered naturally or by human interference, the river will adjust dynamically and geometrically as the fluvial system seeks to establish a state of equilibrium. The river equilibrium concept was explained by Macklin (1948) as the “graded” river in which channel size, cross-sectional shape, and slope are adjusted to the quantities of sediment and water transported so that the river bed neither degrades nor aggrades.

Human activities such as construction of reservoir are major factors in changing in river equilibrium. When the sediment transport is interrupted by a dam, the flow may become sediment-starved and prone to erode the channel

bed and banks, producing channel incision, and coarsening of bed material (Kondolf 2004).

The purpose of this research is to analyze the flowline data and relate it to the degradation of the river bed at different bridge locations in the river. This information may then be used to replace or rehabilitate those bridges that experienced severe degradation.

## II. STUDY AREA

The 800mile long North Canadian River basin is located in the west central portion of Oklahoma, where it is known as Corrumpta Creek. From there it flows eastwardly through the Oklahoma Panhandle, where it is known as the Beaver River. The Coldwater Creek empties into the Beaver River and it flows southwestward into the Texas Panhandle for six miles, turning northeast and back into the Oklahoma Panhandle before continuing on to the east. It enters northwest Oklahoma and turns southeast and takes the name North Canadian River. Just south of the town of Fort Supply, Oklahoma, the river is joined by Wolf Creek. From there, it flows eastward through Oklahoma City and Shawnee on its way to Lake Eufaula in McIntosh County where it joins the waters of the Canadian River (Wikipedia). North Canadian River is a major U.S. waterway. It has total drainage basin of nearly 15,212 sq mi., out of which approximately 61% is in Oklahoma, 33% in Texas, and 6% in New Mexico (Pigg & Coleman 1992).

In Oklahoma North Canadian River flows through thirteen counties: Woodward, Major, Dewey, Blaine, Canadian, Oklahoma, Pottawatomie, Seminole, Okfuskee, Hughes, McIntosh, Pittsburg, and Haskell. The focus of this study area is the middle 463.85 mile reach of the North Canadian River between State Highway 34 crossing in the Woodward County, Oklahoma and US-69 crossing at McIntosh County, Oklahoma (Fig. 1). The North Canadian River starts as a narrow river which gains in size after entering Oklahoma, and becomes a waterway that, in places, is more than a mile wide. Throughout the study reach, North Canadian River has been impounded in two reservoirs:

Canton Lake, Lake Oveholser, and merges into the Canadian River at the Eufaula Lake reservoir.

Canton Lake Dam is on the North Canadian River at mile 394.3, about 2 miles north of the town of Canton and 75 miles northeast of Oklahoma City. The dam was constructed by the corps of engineers and the construction began in 1940 and was completed in 1948. The lake has conservative pool elevation of 1615.0 feet and flood control capacity of 377,100 acre-feet. The shore of the lake is in Blaine County (Kurka 2006).

Lake Overholser in central Oklahoma is located on the east side of Yukon in Canadian county. The lake has a shore length of 7 miles and surface area of 1,500 acres.

Eufaula dam is located on the Canadian river, approximately 12 miles east of Eufaula in McIntosh County, Oklahoma (Austin & Thomas, 2006). At Eufaula Lake North Canadian River merges with the Canadian River. The lake has a drainage area of 47,522 square miles and surface area of 159.375 square miles. The shore length of the lake is over 600 miles. The lake is owned and operated by the U.S. Army Corps of Engineers (Wikipedia).

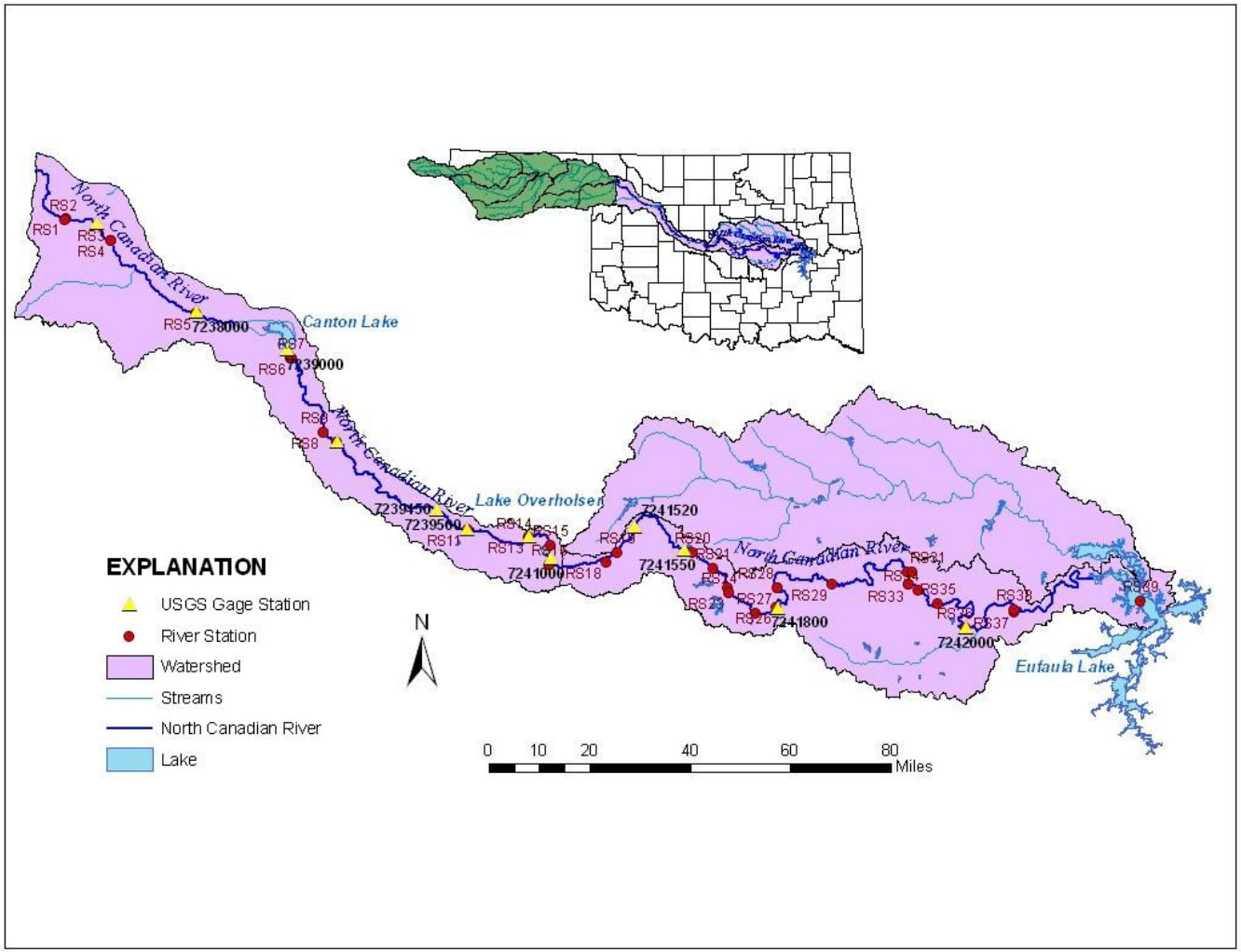



**Figure 1. Location of Study points in North Canadian River, and USGS gage stations**

## III. HYDROLOGY

The physical characteristics of the stream such as channel bed degradation, stream widening, deposition of channel bars, shifting flowline, and stream bank erosion depends on the hydrology of the stream. According to Doyle (2003), “channels formed in fine alluvial material that is easily eroded and transported out of the system with little downstream aggradation will respond to disturbance by lateral adjustments”. As the stream profile degrades, the stream tries to widen to accommodate higher flows, and stream bank erosions increase along with increases in sediment loads. Flow measurement of the stream is one of the fundamental tasks in accessing surface hydrology. USGS stream flow gage stations have been studied in the study reach. Currently there are twelve USGS gaging stations in North Canadian River (Fig.1).

**Table 1. Description of USGS gage stations**

| Data Locations and Descriptions | Data Available |
|---|---|
| USGS 07237500 North Canadian River at Woodward, OK<br>Woodward County, Oklahoma<br>Hydrologic Unit Code 11100301<br>Latitude 36°26'12", Longitude 99°16'41" NAD27<br>Drainage area 11,589 square miles<br>Contributing drainage area 6,777 square miles<br>Gage datum 1,829.95 feet above sea level NGVD29 | 1938-2006 |
| *USGS 07238000 North Canadian River near Seiling, OK*<br>Major County, Oklahoma<br>Hydrologic Unit Code 11100301<br>Latitude 36°11'00", Longitude 98°55'15" NAD27<br>Drainage area 12,261 square miles<br>Contributing drainage area 7,414 square miles<br>Gage datum 1,675.53 feet above sea level NGVD29 | 1924-2006 |
| USGS 07239000 North Canadian River at Canton, OK<br>Blaine County, Oklahoma<br>Hydrologic Unit Code 11100301<br>Latitude 36°04'37", Longitude 98°35'47" NAD27<br>Drainage area 12,484 square miles<br>Contributing drainage area 7,601 square miles<br>Gage datum 1,562.50 feet above sea level NGVD29 | 1938-2003 |
| *USGS 07239300 North Canadian River blw Weavers Ck nr Watonga, OK*<br>Blaine County, Oklahoma<br>Hydrologic Unit Code 11100301<br>Latitude 35°48'43", Longitude 98°25'14" NAD27<br>Drainage area 12,736 square miles<br>Contributing drainage area 7,837 square miles<br>Gage datum 1,453.60 feet above sea level NGVD29 | 1984-2006 |

**Table 1. Continued**

| Data Locations and Descriptions | Data Available |
|---|---|
| USGS 07239500 North Canadian River near El Reno, OK<br>Canadian County, Oklahoma<br>Hydrologic Unit Code 11100301<br>Latitude 35°33'47", Longitude 97°57'26" NAD27<br>Drainage area 13,042 square miles<br>Contributing drainage area 8,143 square miles<br>Gage datum 1,295.00 feet above sea level NGVD29 | 1903-2006 |
| *USGS 07239700 North Canadian River near Yukon, OK*<br>Canadian County, Oklahoma<br>Hydrologic Unit Code 11100301<br>Latitude 35°32'22", Longitude 97°44'32" NAD27<br>Drainage area 13,183 square miles<br>Gage datum 1,247.66 feet above sea level NGVD29 | 2000-2006 |
| USGS 07241000 North Canadian River below Lake Overholser near OKC, OK<br>Oklahoma County, Oklahoma<br>Hydrologic Unit Code 11100301<br>Latitude 35°28'43", Longitude 97°39'47" NAD27<br>Drainage area 13,222 square miles<br>Contributing drainage area 8,323 square miles<br>Gage datum 1,194.66 feet above sea level NGVD29 | 1921-2006 |
| *SGS 07241520 North Canadian River at Britton Rd at OKC, OK*<br>Oklahoma County, Oklahoma<br>Hydrologic Unit Code 11100302<br>Latitude 35°33'56", Longitude 97°22'01" NAD27<br>Drainage area 13,413 square miles<br>Contributing drainage area 8,514 square miles<br>Gage datum 1,109.40 feet above sea level NGVD29 | 1989-2006 |

**Table 1. Continued**

| Data Locations and Descriptions | Data Available |
|---|---|
| *USGS 07241550 North Canadian River near Harrah, OK*<br>Oklahoma County, Oklahoma<br>Hydrologic Unit Code 11100302<br>Latitude 35°30'01", Longitude 97°11'37" NAD27<br>Drainage area 13,501 square miles<br>Contributing drainage area 8,602 square milesGage datum 1,055.69 feet above sea level NGVD29 | 1969-2006 |
| *USGS 07241800 North Canadian River at Shawnee, OK*<br>Pottawatomie County, Oklahoma<br>Hydrologic Unit Code 11100302<br>Latitude 35°19'59", Longitude 96°52'09" NAD27<br>Drainage area 13,730.00 square miles<br>Contributing drainage area 8,831.00 square miles | 2001-2006 |
| USGS 07242000 North Canadian River near Wetumka, OK<br>Hughes County, Oklahoma<br>Hydrologic Unit Code 11100302<br>Latitude 35°15'56", Longitude 96°12'21" NAD27<br>Drainage area 14,290 square miles<br>Contributing drainage area 9,391 square miles<br>Gage datum 678.28 feet above sea level NGVD29 | 1924-2006 |

Annual peak discharge is the annual instantaneous maximum discharge. Human land use practices such as agricultural and forest clearing also impact the fluvial geomorphic systems. In addition to this, channel changes are variable in time, depending somewhat on the timing of floods and droughts. Annual peak discharge plots were downloaded from USGS gaging stations to evaluate the historical flood occurrences. In 1946, record-breaking flood occurred in the streams of the Texas Panhandle and Oklahoma. Precipitation ranged from 1 to more than 8 inches during the period of October 4-10. As a result of which, high water levels were reached in the headwater of the North Canadian River (Jordan 1946). Due to the excessive rainfall in this region, peak streamflow were recorded as 42000cfs at Woodward OK (Fig. 2), 28000 cfs at Seiling OK (Fig. 3), 25000 cfs at Canton OK (Fig. 4), 15000cfs at El Reno OK (Fig. 7), and 15000cfs at Wetunka OK (Fig. 13) in 1946. Peak streamflow records of 14000cfs at El Reno (Fig. 7), 8000cfs at Oklahoma City (Fig. 10), and 25000 at Harrah OK (Fig. 11) mimics the flood of 1997 and peak streamflows of 9000cfs at Oklaoma City OK (Fig. 10), and 17000 cfs at Harrah OK (Fig. 11) were due to the flood in 1995.

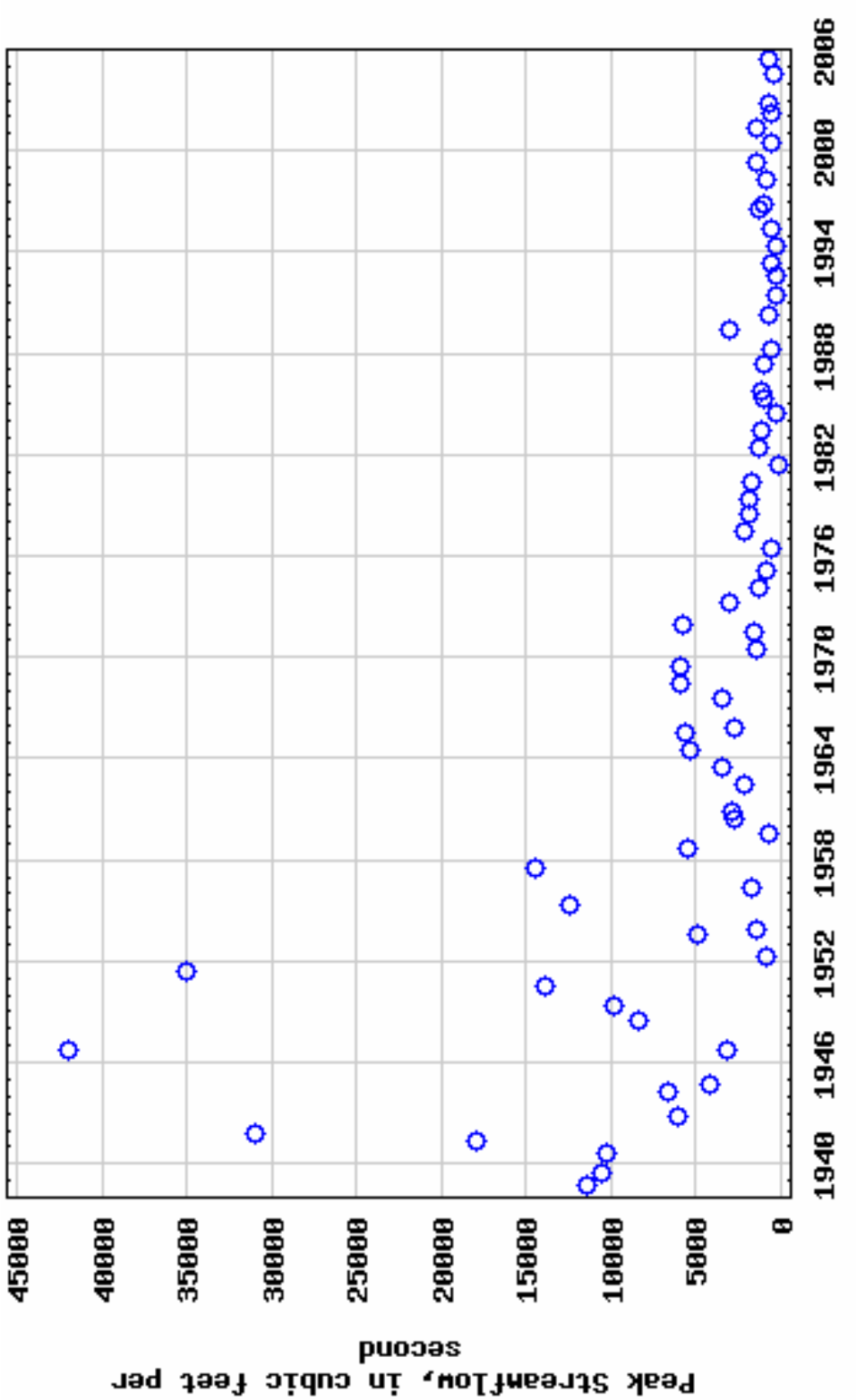



**Figure 2 . Annual peak streamflow in North Canadian River at Woodward (USGS 07237500), OK**

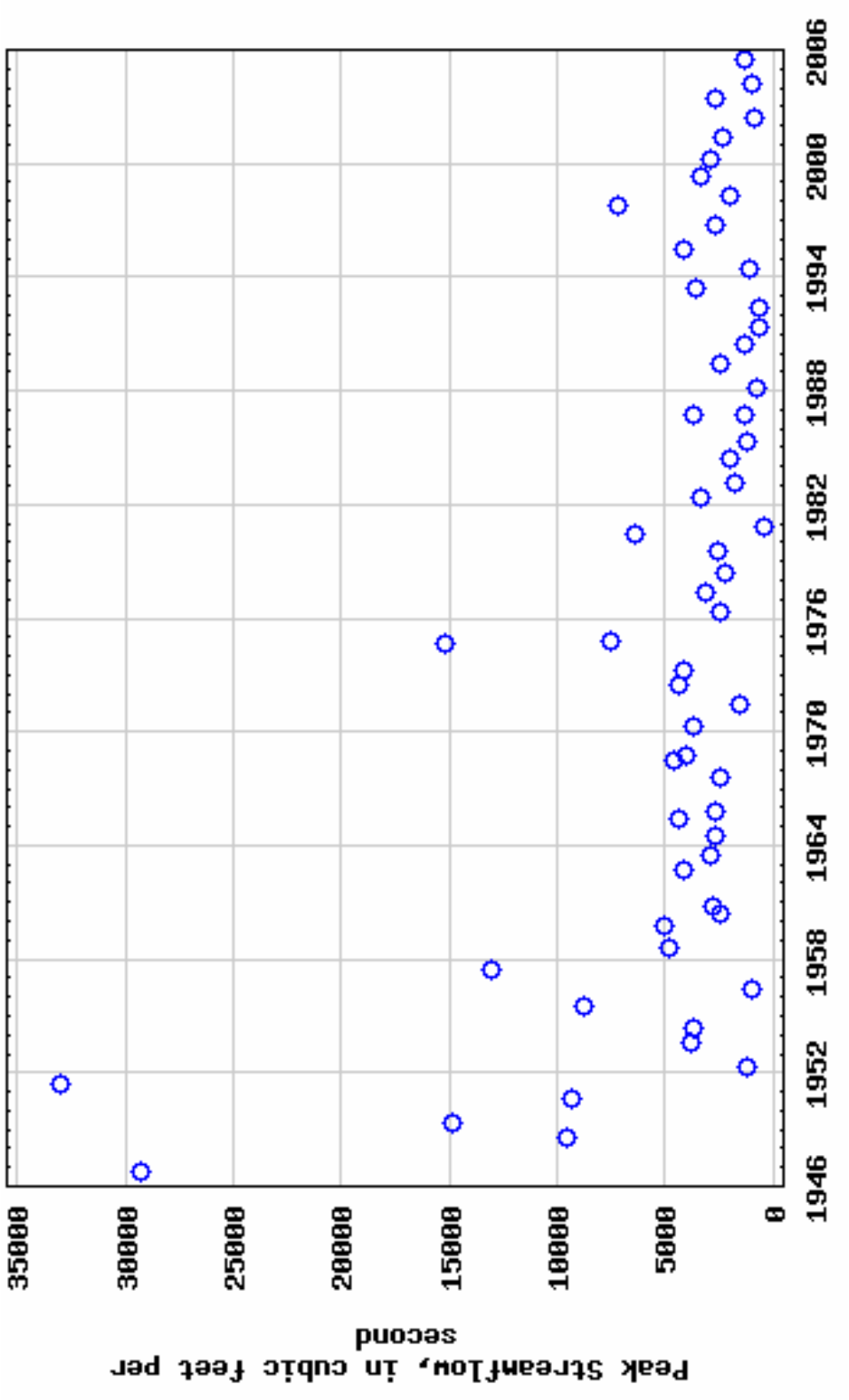



**Figure 3. Annual peak streamflow in North Canadian River at Seiling (USGS 07238000), OK**

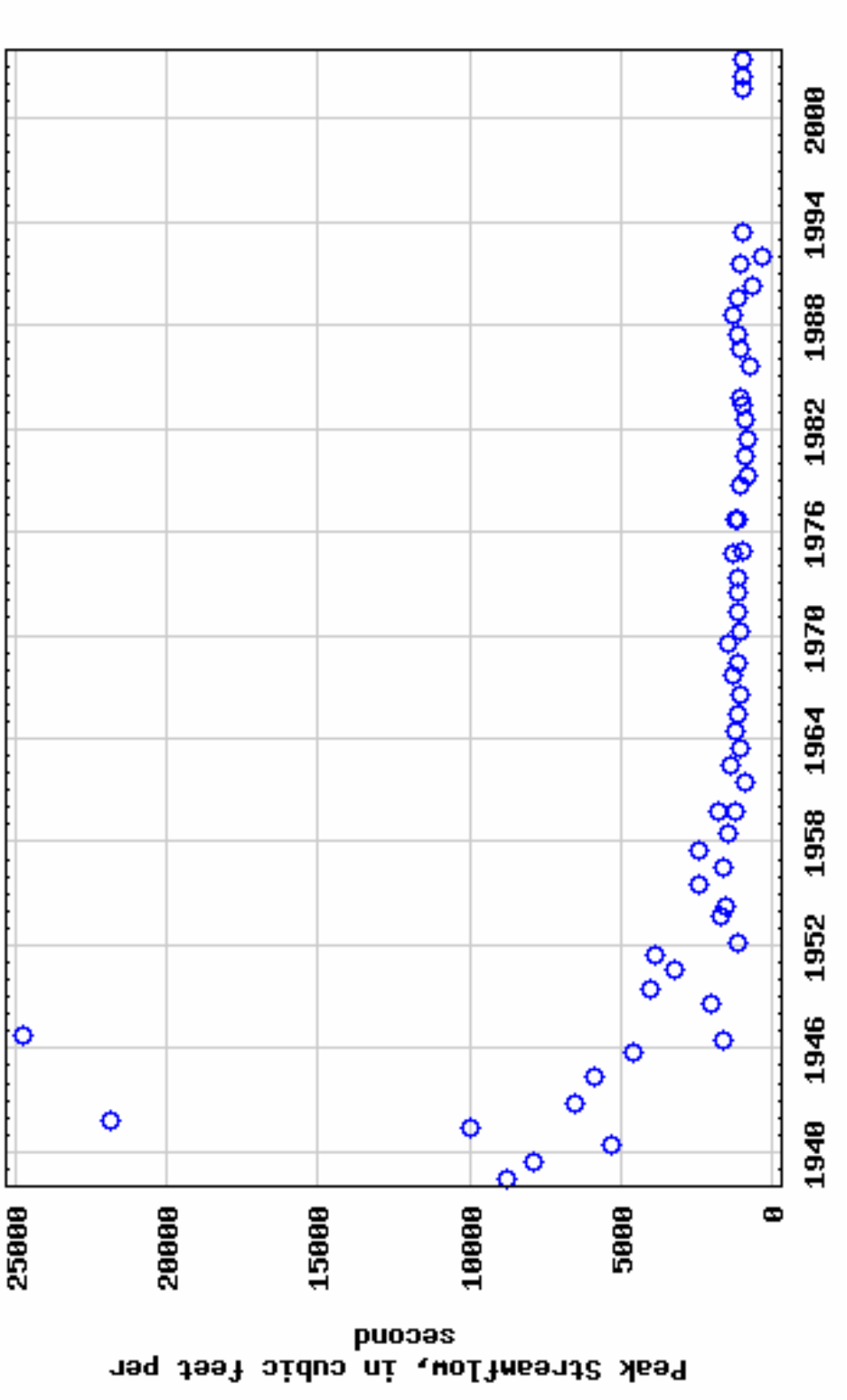



**Figure 4. Annual peak streamflow in North Canadian River at Canton (USGS 07239000), OK**

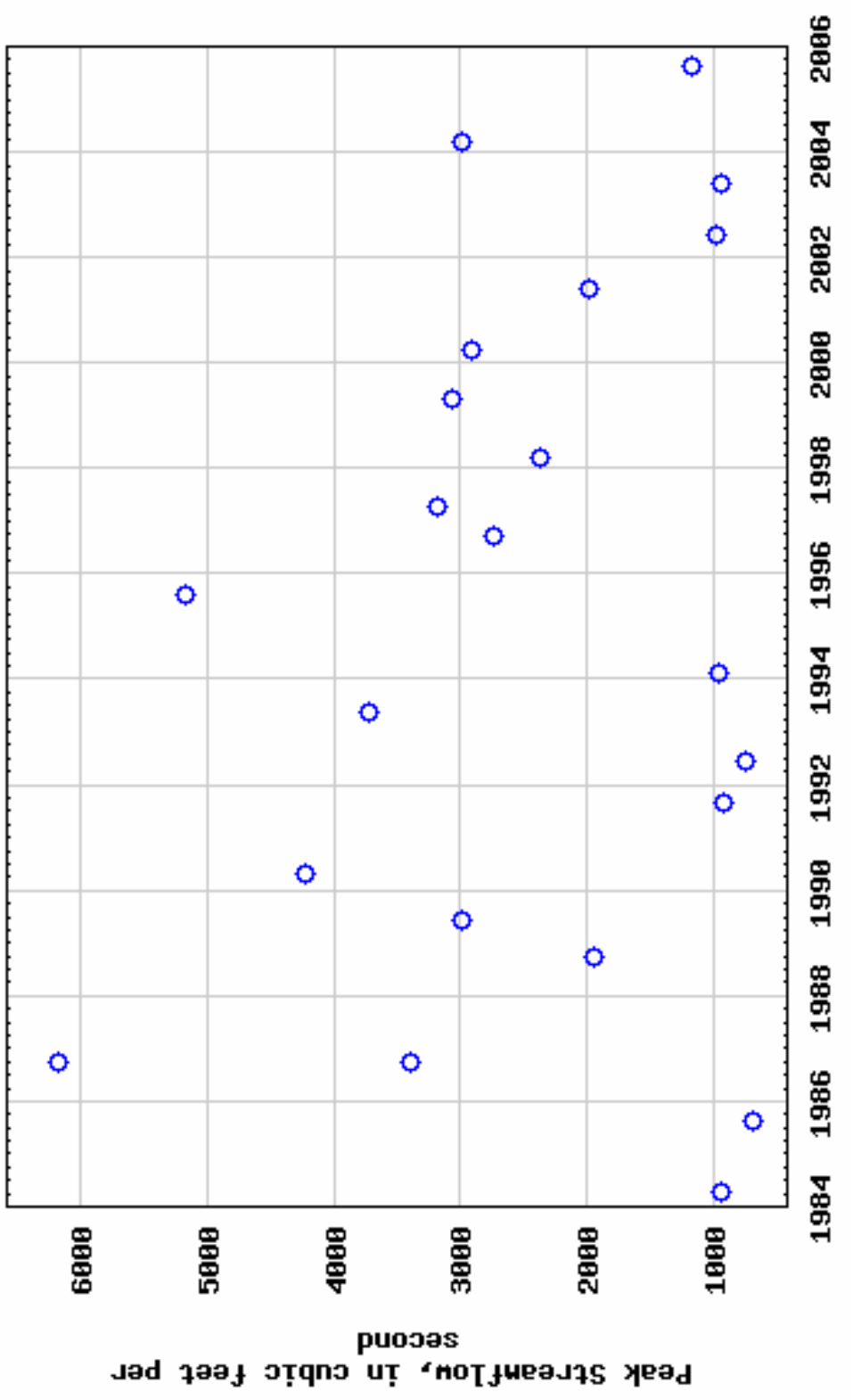



**Figure 5. Annual peak streamflow in North Canadian River at Watonga (USGS 07239300), OK**

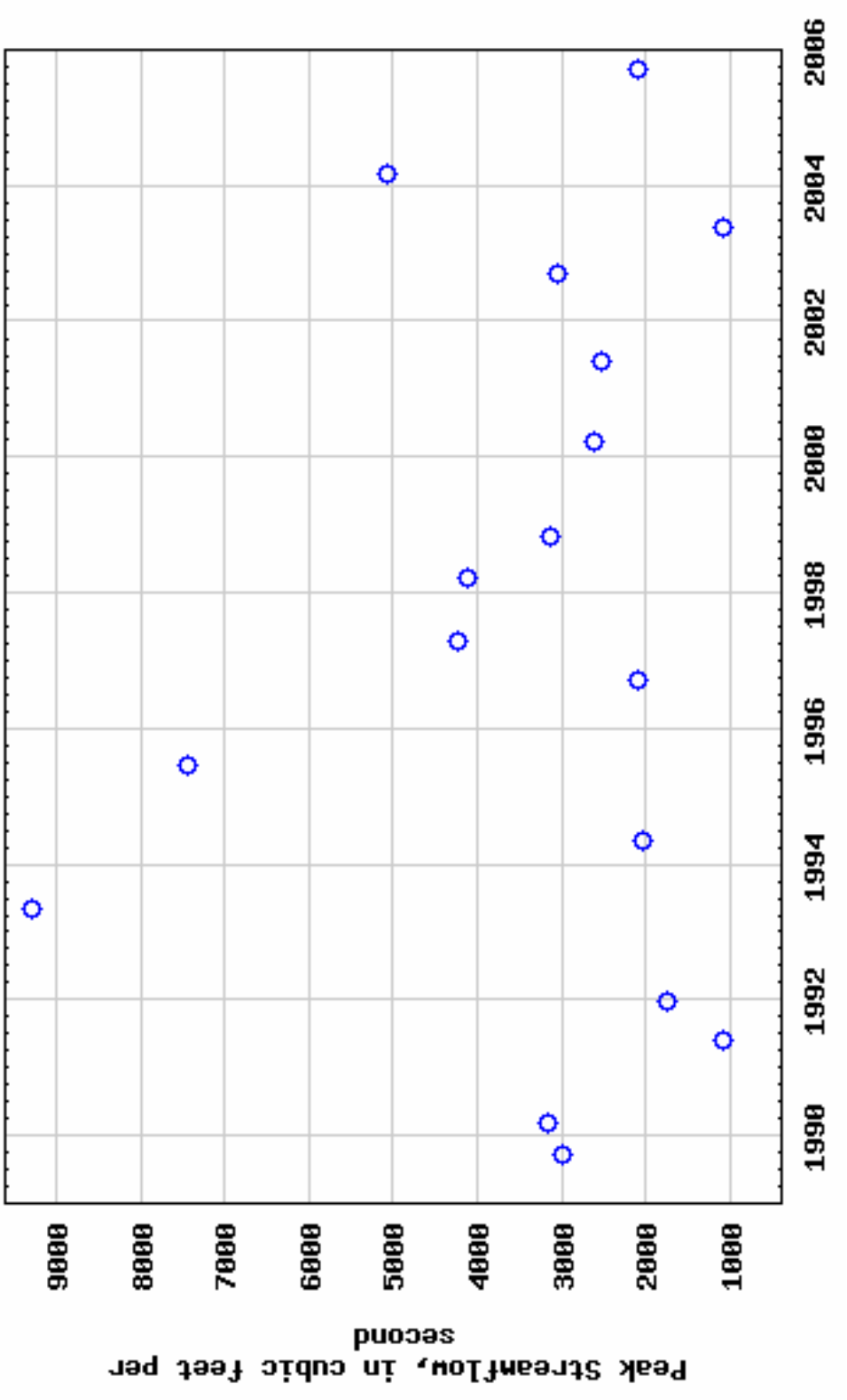



**Figure 6. Annual peak streamflow in North Canadian River near Calumet (USGS 07239450),**

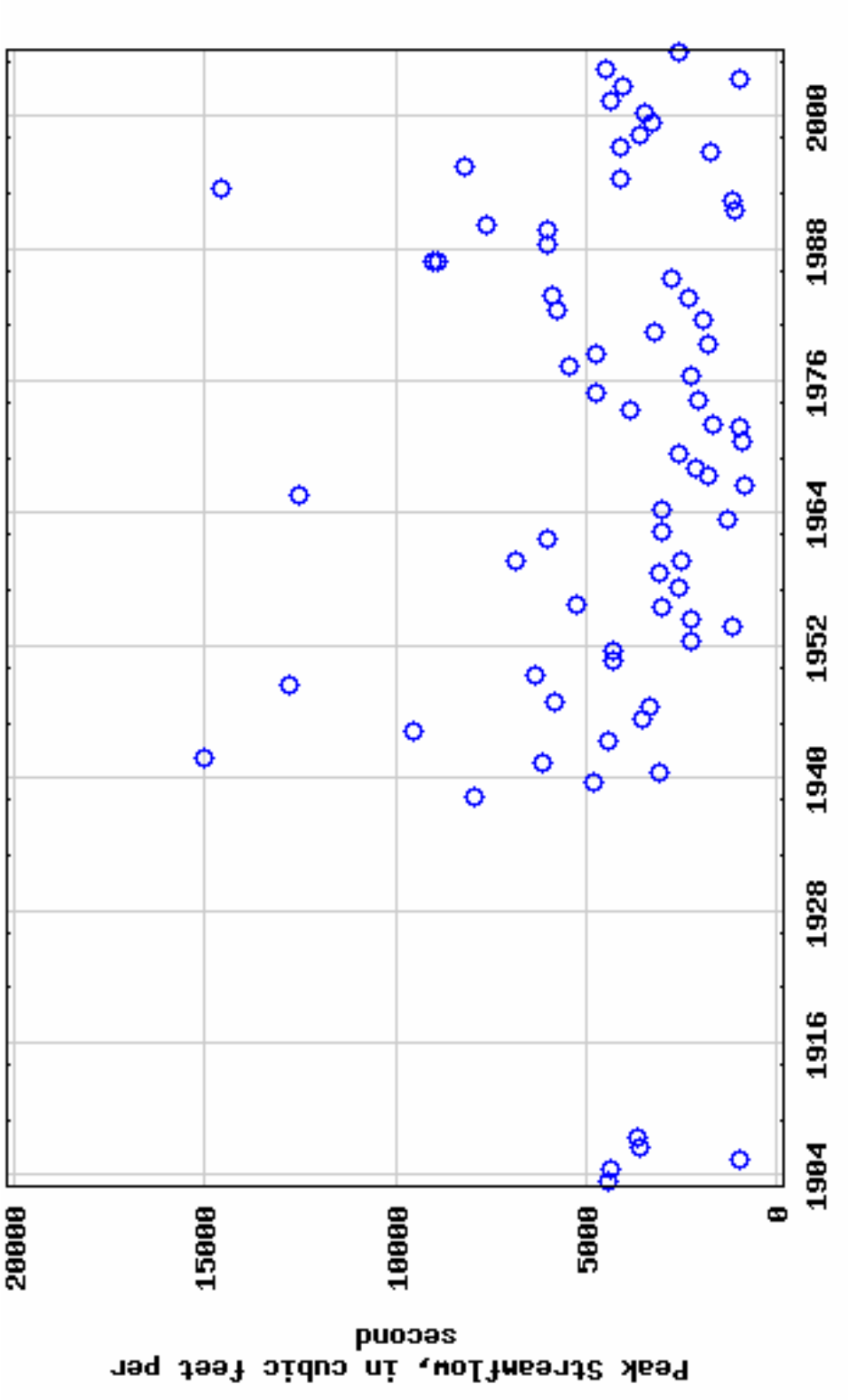



**Figure 7. Annual peak streamflow in North Canadian River near El Reno (USGS 07239500), OK**

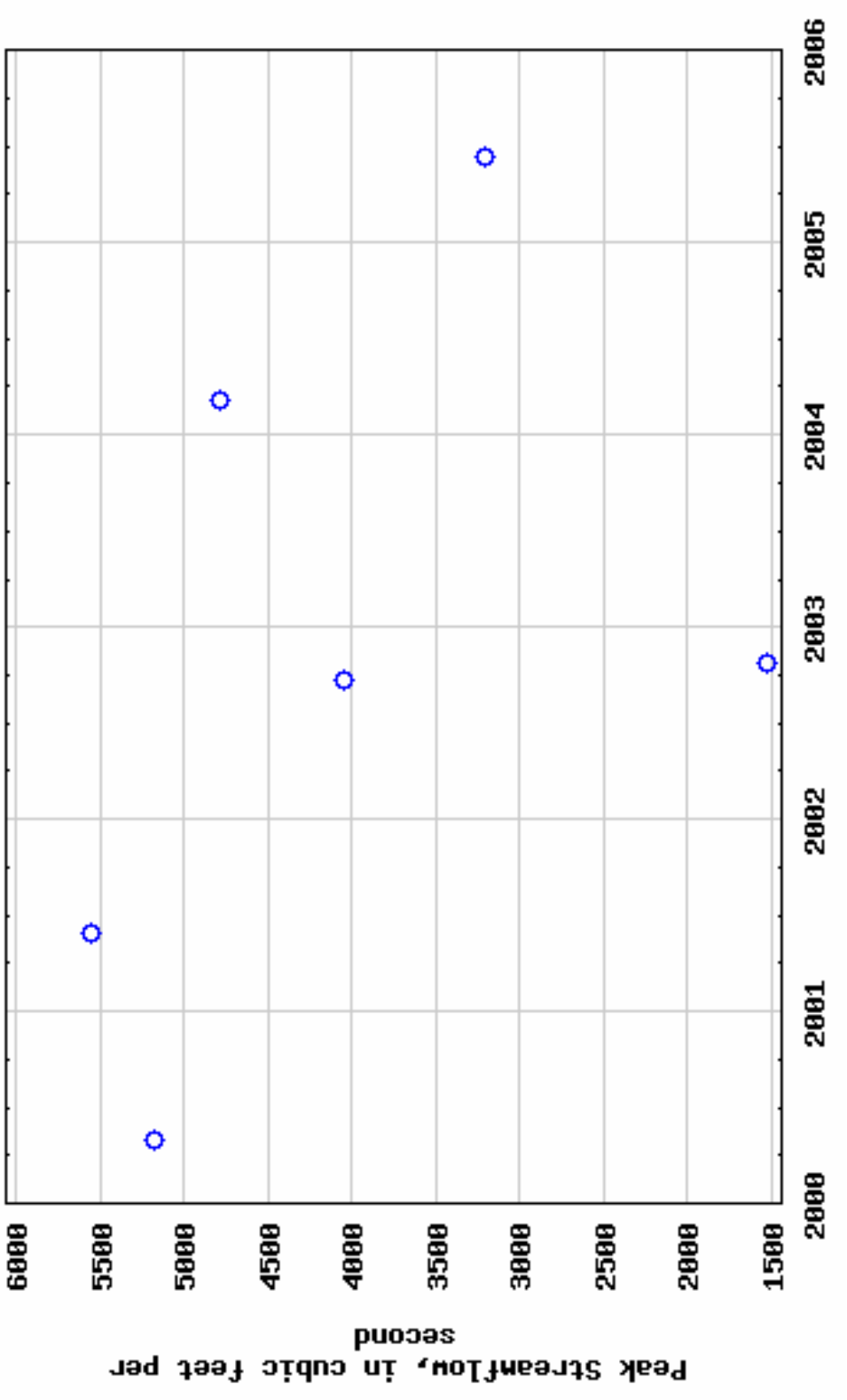



**Figure 8. Annual peak streamflow in North Canadian River near Yukon (USGS 07239700), OK**

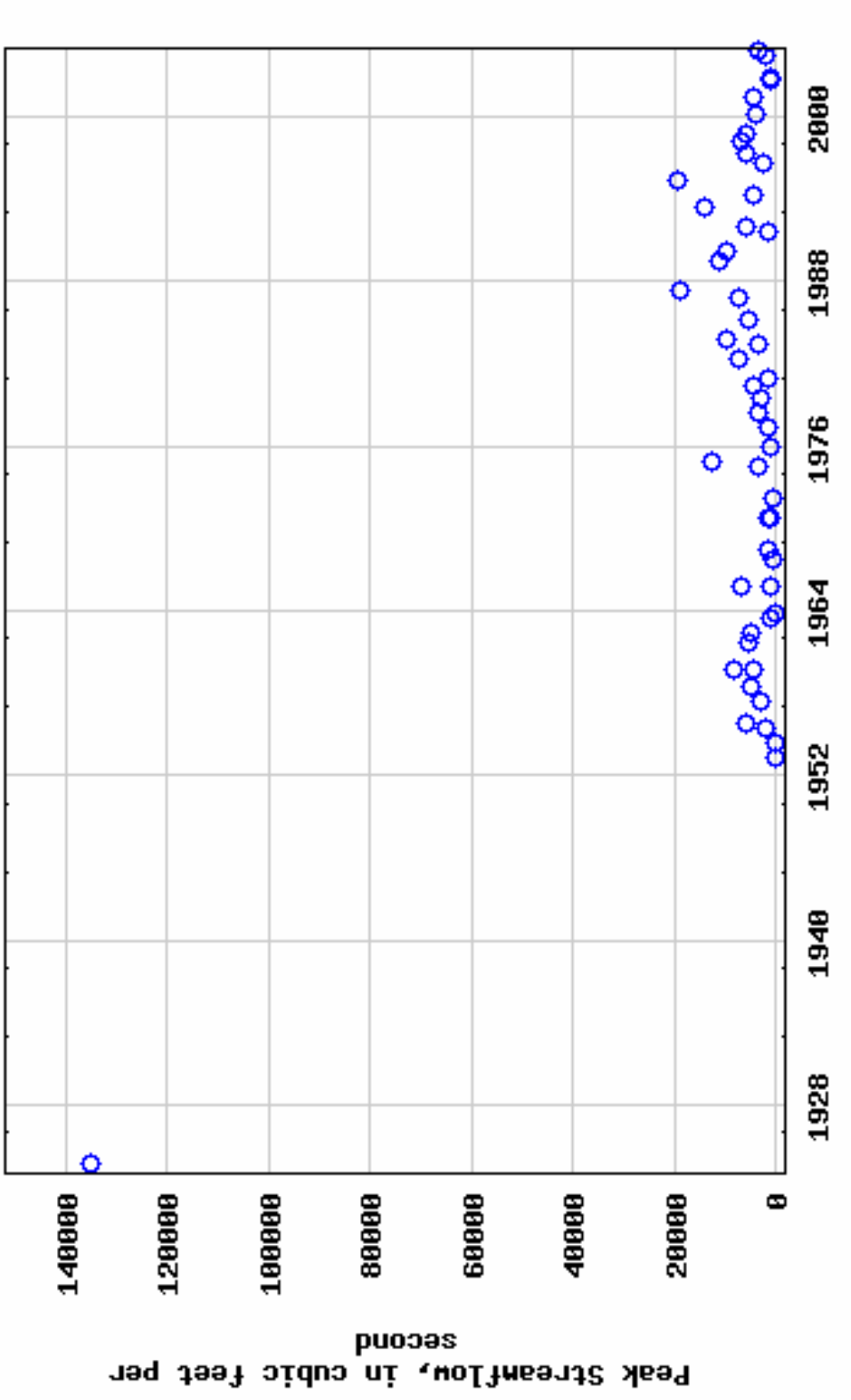



**Figure 9. Annual peak streamflow in North Canadian River near OKC (USGS 07241000), OK**

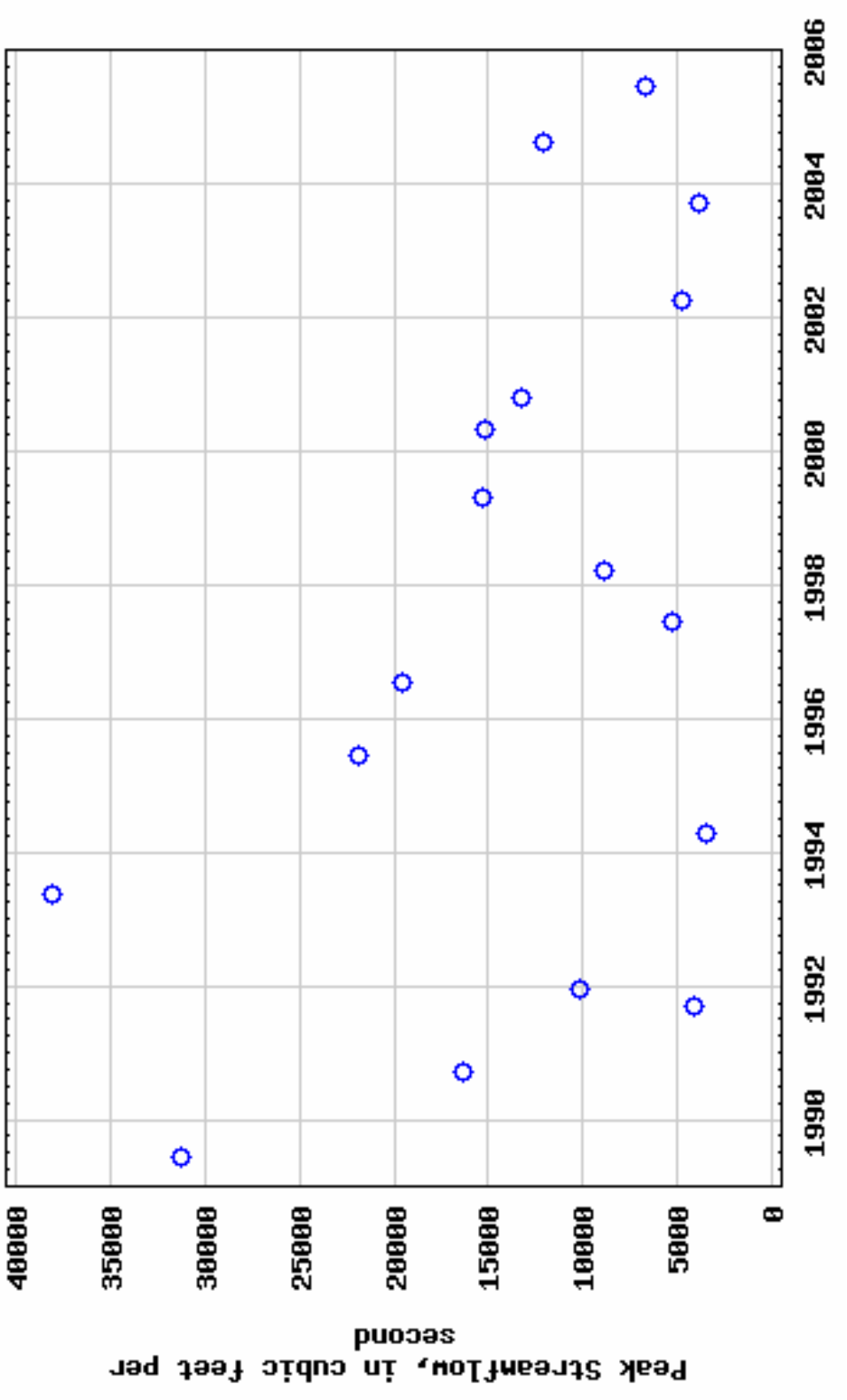



**Figure 10. Annual peak streamflow in North Canadian River at OKC (USGS 07241520), OK**

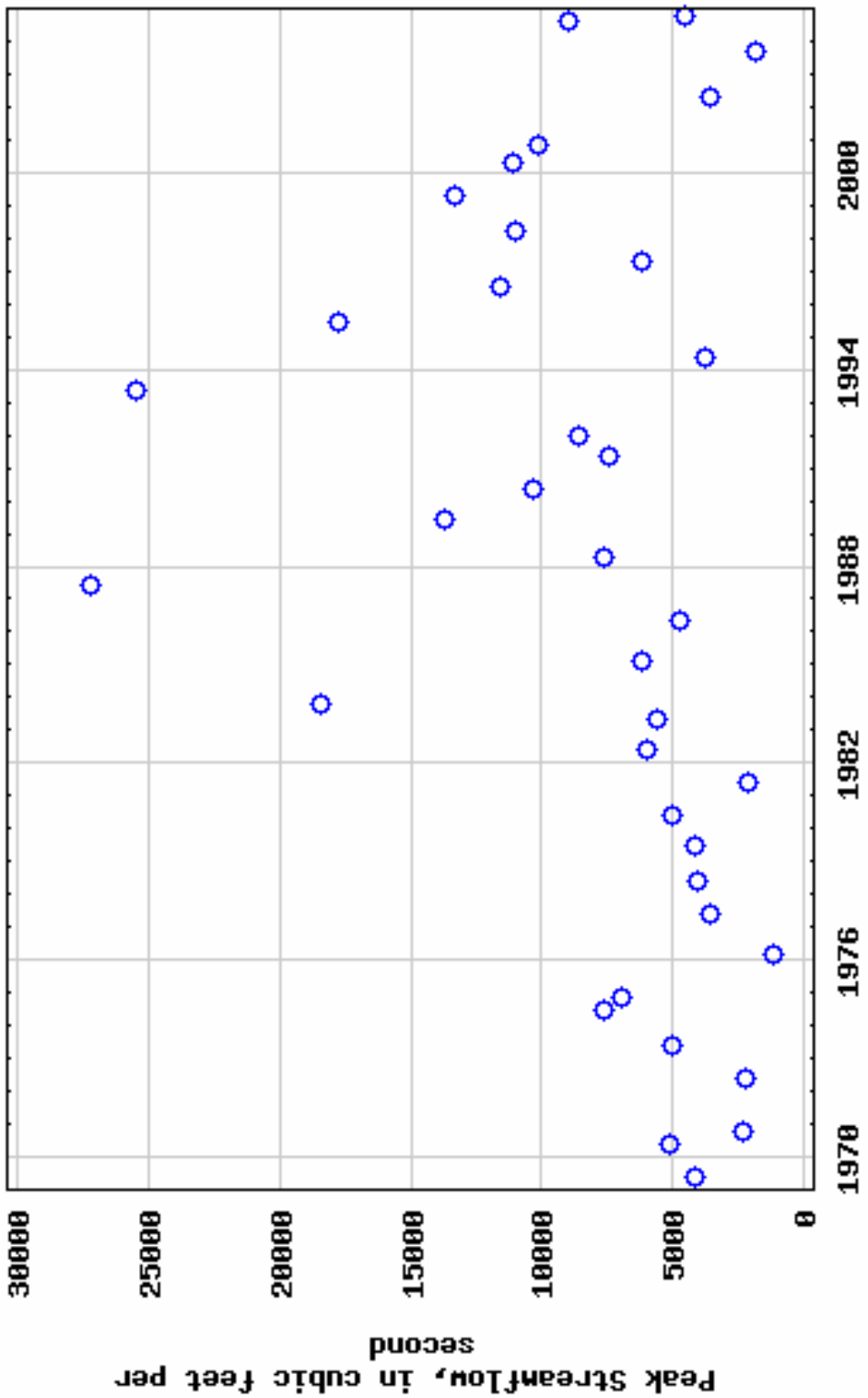



**Figure 11. Annual peak streamflow in North Canadian River near Harrah (USGS 07241550),**

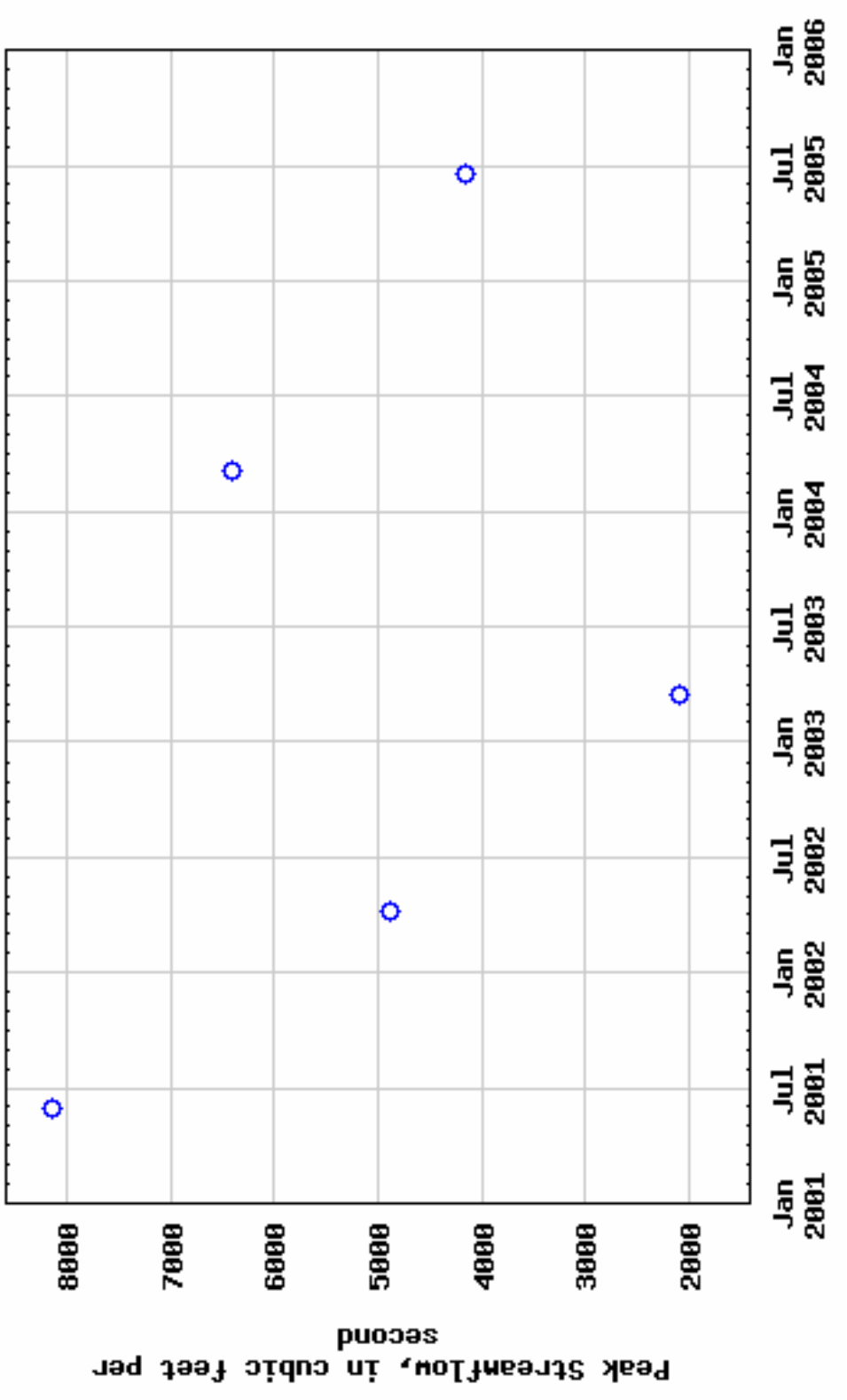



**Figure 12. Annual peak streamflow in North Canadian River at Shawnee (USGS 07241800), OK**

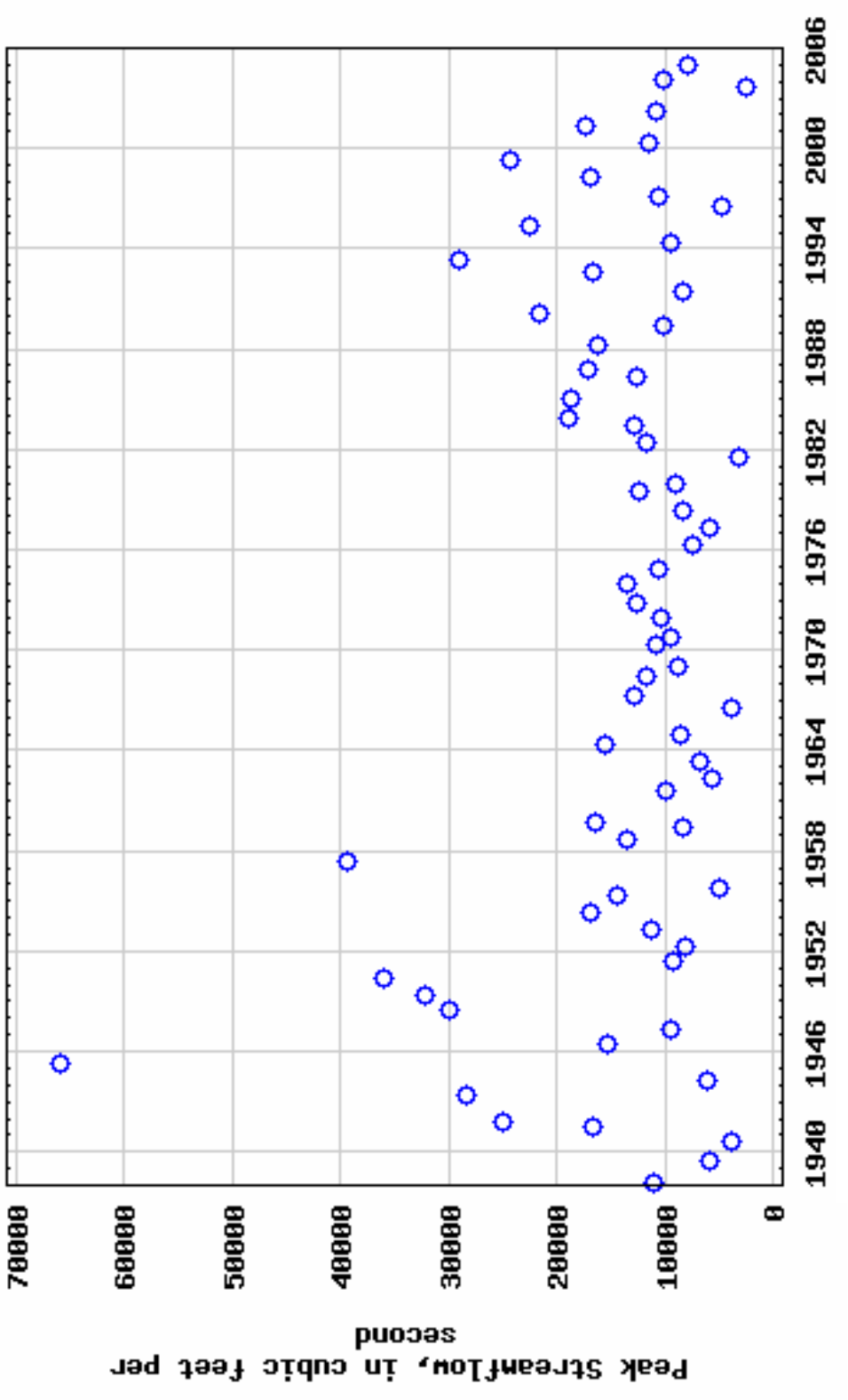



Figure 13. Annual peak streamflow in North Canadian River at Wetunka (USGS 07242000), OK

Gilvier (1999) studied a number of areas in which fluvial geomorphology is directly relevant and beneficial to river engineering. These are when:

1) River channel functions as a three dimensional form with longitudinal, transverse, and vertical dimensions (x,y,z-directions) involving changes in morphology and amount of water and sediment.
2) The river system functions in response to water and sediment coming from the upstream watersheds.
3) The planform of a river normally varies through time, but the dynamics of natural channel adjustment varies between and along rivers.
4) The geomorphic stability of a river system is disturbed by activities such as river training, removing riparian vegetation, land use, and climatic change etc.

In this study, the 463.85 mile river is divided into 3 Reaches: Reach 1- RS1 to Canton Lake Dam, Reach 2- Canton Lake Dam to Lake Overholser dam, and Lake Overholser dam to RS 40 (Bridge No. 15585). The objective of this study was to evaluate the downstream effects of each dam in river degradation. Data collection at each site included channel gradient, cross-sectional geometry, and bed material composition. Channel gradient from one river station to another was calculated arithmetically and taken mean for each study Reach. River meandering between two successive river stations was determined by calculating sinuosity as shown in Figure 14 using Geographic Information System (GIS), to examine the downstream effects of dams in meandering channels. Sinuosity is

defined as a ratio of total length between two river stations along the flowline to shortest length of the channel.

The meandering tendency of the North Canadian River in Oklahoma increases as its flows. As the sinuosity is increasing along the length, the slope of the river is simultaneously decreasing. Reach-1 is less meandered where the slope is high. Reach-3 is highly meandered where the slope is less (Table 2).

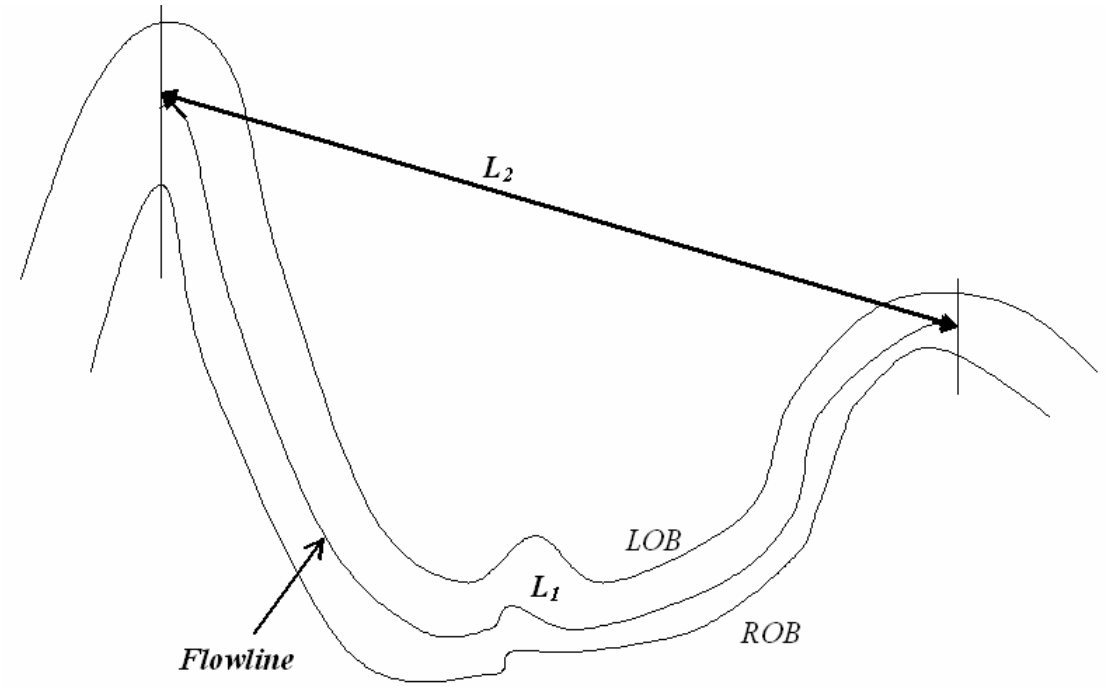
Longitudinal and vertical changes of the river channel bed are also studied and will be discussed separately in another chapter.

**Table 2. Sinuosity and slope study of North Canadian River**

| Study of reach | | | | Study of River Stations | | |
|---|---|---|---|---|---|---|
| **Reach** | **Location** | **Reach slope** | **Reach Sinuosity** | **River Stations** | **Slope** | **Sinuosity** |
| 1 | RS 1 (b16523) to Canton Lake Dam | 3.83 | 1.53 | RS 1 to RS 2 | 0.00 | 0.00 |
| | | | | RS 2 to RS 3 | 3.94 | 1.35 |
| | | | | RS 3 to RS 4 | 0.00 | 1.12 |
| | | | | RS 4 to RS 5 | 4.13 | 1.51 |
| 2 | Canton Lake Dam to Lake Overholser Dam | 3.08 | 1.80 | RS 5 to RS 6 | 3.42 | 1.64 |
| | | | | RS 6 to RS 7 | 0.00 | 0.00 |
| | | | | RS 7 to RS 8 | 3.13 | 1.77 |
| | | | | RS 8 to RS 9 | 0.00 | 1.33 |
| | | | | RS 9 to RS 10 | 3.60 | 1.14 |
| | | | | RS 10 to RS 11 | 2.87 | 1.00 |
| | | | | RS 11 to RS 12 | -35.17 | 1.80 |
| | | | | RS 12 to RS 13 | 2.66 | 1.37 |
| | | | | RS 13 to RS 14 | 0.00 | 0.00 |
| | | | | RS 14 to RS 15 | 0.00 | 0.00 |
| 3 | Lake Overholser Dam to RS 40 (b15585) | 2.53 | 2.24 | RS 15 to RS 16 | 2.06 | 1.65 |
| | | | | RS 16 to RS 17 | 6.85 | 1.64 |
| | | | | RS 17 to RS 18 | 0.00 | 1.00 |
| | | | | RS 18 to RS 19 | 3.19 | 1.21 |
| | | | | RS 19 to RS 20 | 1.90 | 1.04 |
| | | | | RS 20 to RS 21 | 2.31 | 2.58 |

**Table 2. Continued**

| Study of reach | | | | Study of River Stations | | |
|---|---|---|---|---|---|---|
| **Reach** | **Location** | **Reach slope** | **Reach Sinuosity** | **River Stations** | **Slope** | **Sinuosity** |
| 3 | Lake Overholser Dam to RS 40 (b15585) | 2.53 | 2.4 | RS 20 to RS 21 | 2.31 | 2.58 |
| | | | | RS 21 to RS 22 | 1.67 | 1.39 |
| | | | | RS 22 to RS23 | 3.03 | 2.41 |
| | | | | RS 23 to RS 24 | -2.97 | 2.22 |
| | | | | RS 24 to RS 25 | 0.00 | 0.79 |
| | | | | RS 25 to RS 26 | 4.27 | 1.39 |
| | | | | RS 26 to RS 27 | 2.73 | 1.69 |
| | | | | RS 27 to RS 28 | 0.87 | 2.90 |
| | | | | RS 28 to RS 29 | 4.30 | 10.82 |
| | | | | RS 29 to RS 30 | 3.22 | 2.15 |
| | | | | RS 30 to RS 31 | 2.41 | 2.29 |
| | | | | RS 31 to RS 32 | 0.00 | 0.00 |
| | | | | RS 32 to RS 33 | 11.87 | 1.57 |
| | | | | RS 33 to RS 34 | 0.00 | 0.00 |
| | | | | RS 34 to RS 35 | 12.11 | 1.35 |
| | | | | RS 35 to RS 36 | -0.77 | 1.87 |
| | | | | RS 36 to RS 37 | 2.98 | 3.16 |
| | | | | RS 37 to RS 38 | 4.81 | 1.71 |
| | | | | RS 38 to RS 39 | 0.00 | 0.00 |
| | | | | RS 39 to RS 40 | 2.33 | 1.78 |




$$Sinuosity = \frac{Flowline \quad Length(L_1)}{Shortest \quad Length(L_2)}$$

**Figure 14. Schematic diagram of sinuosity of natural channels**

## IV. ANALYSIS OF CROSS-SECTIONAL GEOMETRY

Field data measured for a long period of time by Oklahoma Department of Transportation were examined in this study. Throughout the study reach, 40 River Stations (RS) were selected: RS 1 to Canton Lake Dam in Reach 1, Canton Lake Dam to Lake Overholser dam in Reach 2, Lake Overholser dam to RS 40 in Reach 3. Twenty-four out of forty River Stations have data on cross-section geometry. These river stations are measured in bridge crossings.

Among the 5 river stations in Reach 1, aggradations are observed in RS 1 and RS 3. RS 1 has the aggradation of 1.1 feet from year 1965 to 1991 whereas RS 3 is the most stable river station in Reach 1 having only the slight aggradation of 0.31 feet from years 1969 to 1991. Bed materials at RS 1 and RS 3 (Fig. 16) are characterized as Sand to Red Bed. RS 2 (Fig. 15) at the crossing of SH 34 shows the maximum degradation of 4.63 feet from year 1965 to 2000. The degradation is primarily on the left side of the river section. RS 4 at the crossing of SH 50 and RS 5 (Fig. 17) at the crossing of US 60 shows the degradation of 2.78 feet and 3.40 feet in 22 and 34 years respectively.

Reach-2 has eleven river stations from RS 6 to RS 15. Among these river stations, five are observed with aggradations. Downstream of Canton Lake Dam, two conjugative river stations, RS 6 (Fig. 18), and RS 7, shows the aggradation of 0.68 feet, and 0.50 feet in 48, 46 years respectively. The aggradations at these river stations shows notable results since both of the river stations are only 3.69 miles downstream of the Canton Lake Dam. Similarly, RS 12 (Fig. 22) at the crossing of US-81, RS 13 (Fig. 23) at the crossing of SH-4, and RS 16 (Fig. 26) at the crossing of US-66 show the

aggradation of 1.75 feet, 0.5 feet, and 8.4 feet in 32, 53, and 47 years respectively. RS 9 (Fig. 20) at the crossing of US-270 shows the maximum degradation of 5.83 feet in Reach-2. The degradation is occurred in the 58 year time period from 1937 to 1995. Similarly, RS 11 at the crossing of US-81 shows the maximum degradation rate of 1.01 feet/year.

Reach-3 has twenty-four river stations from RS 17 to RS 40. Degradation is observed in RS 17 (Fig. 27) and RS 18 (Fig. 28) at the crossing of I-40. These two conjugative river stations are at the downstream of the Lake Overholser dam at the distance of 2.40 miles. From 1964 to 2005, RS 17 is subjected to a degradation of 5 feet and RS 18 for 3.33 feet respectively. Bed materials for both of the river stations are characterized as Sand to Red Bed. Beyond RS 18, four conjugative river stations are subjected to the aggradations. Among them, RS 21 (Fig. 30) at the crossing of US-62, has the maximum aggradation of 9.75 feet in 20 years from 1985. RS 20 (Fig. 29) at the crossing of US-62 shows the aggradation of 4.75 feet in 19 years and the flowline at this river station has shifted from right to the middle. Bed materials for these four river stations are characterized as Sand and Sand Stone. RS 23 at the crossing of SH-270 is observed with maximum degradation rate in whole study reach. This river station has experienced 15.6 feet degradation in 11 years from 1983 to 1994. Bed material at this river stations is characterized as Sand and Soft Sandy Clay. Similarly, RS 24 to RS 27, RS 29, RS 31, and RS 32 are subjected to the constant degradation which ranges from 0.09 feet to 4.43 feet. RS 33 (Fig. 32) at the crossing of I-40 has experienced maximum degradation of 17.67 feet throughout the study reach from 1962 to 2000. Bed material at this river station is Sand to Medium Hard Shale. At this river station degradation occurs

primarily on the right side and Pier Nos. 15 and 16 are in danger. In contrast to this, calculated value at RS 34 (Fig. 33) at the same distance of RS 33 has experienced the aggradation of 0.42 feet in 40 years. Similarly, RS 36 (Fig. 35) at the crossing of SH-27 has the aggradation of 4.08 feet in 55 years. Other river stations RS 35 (Fig. 34), and RS 37 (Fig. 36) to RS 40 (Fig. 38) are facing degradation of the bed. Among them, RS 39 (Fig. 36) at the crossing of SH-84 has experienced maximum degradation of 15 feet from year 1958 to 2005 and degradation is primarily on the left side which has created potential threat to Pier Nos. 1 and 2. At RS 35, the flowline has shifted from right to the middle. RS 40 (Fig. 38) is within the Eufaula Lake dam which has experienced a degradation of 3.50 feet from 1958 to 2003. Bed material at this river station is Rock.

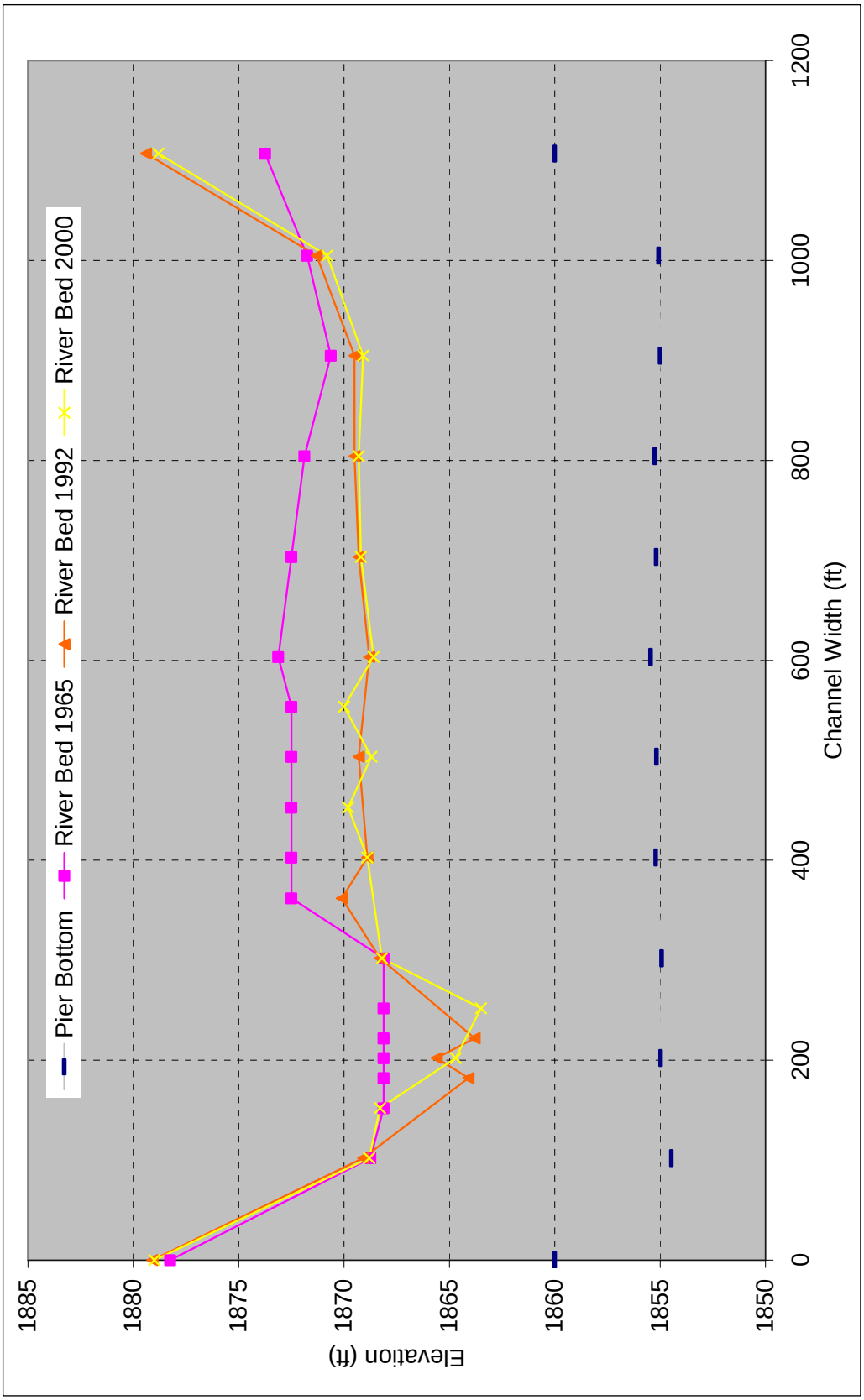



**Figure 15. Cross-section at bridge (Key No. 16642 and RS 2) on SH 34, North Canadian River, OK**

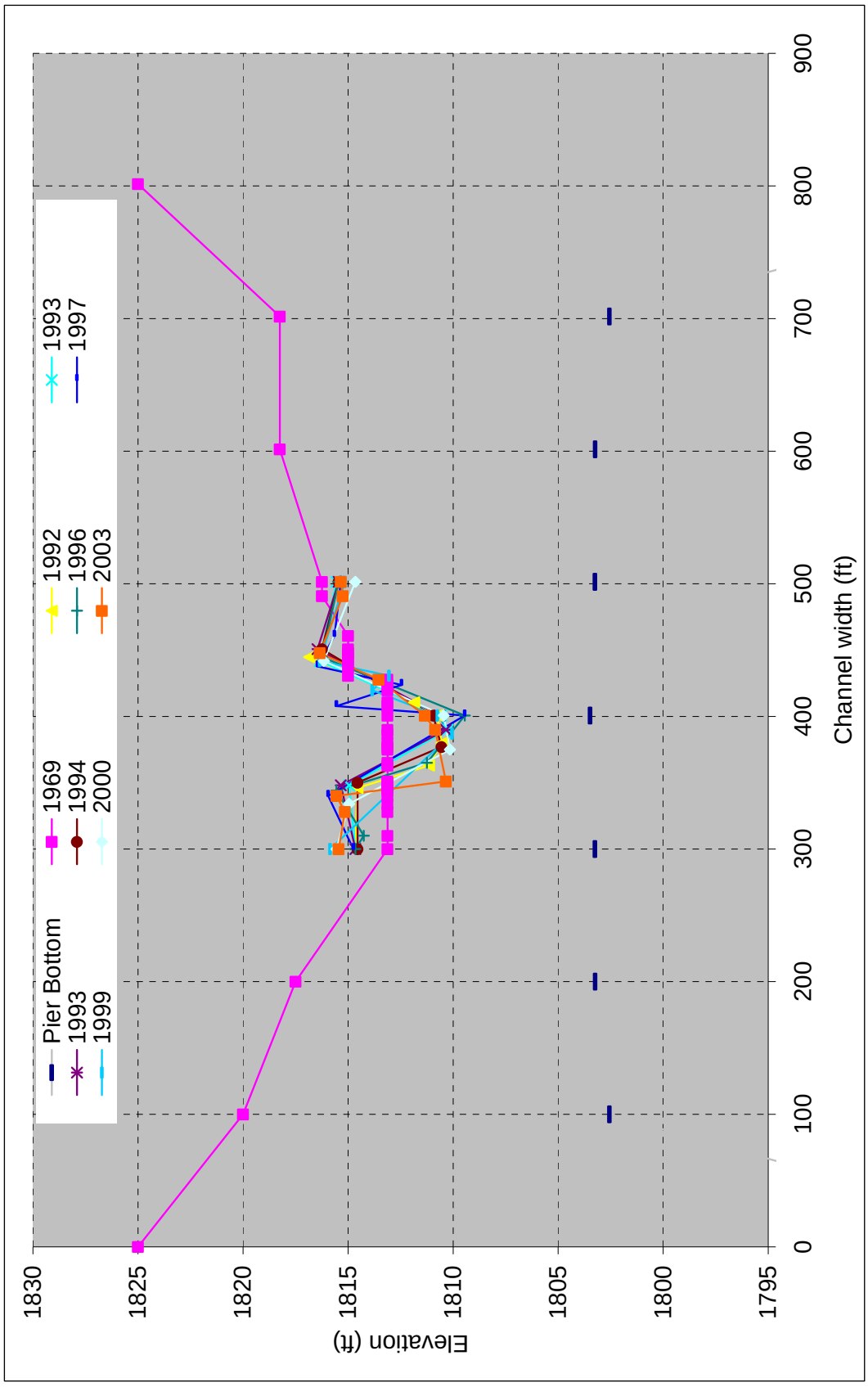



**Figure 16. Cross-section at bridge (Key No. 17602 and RS 4) on SH 50, North Canadian River, OK**

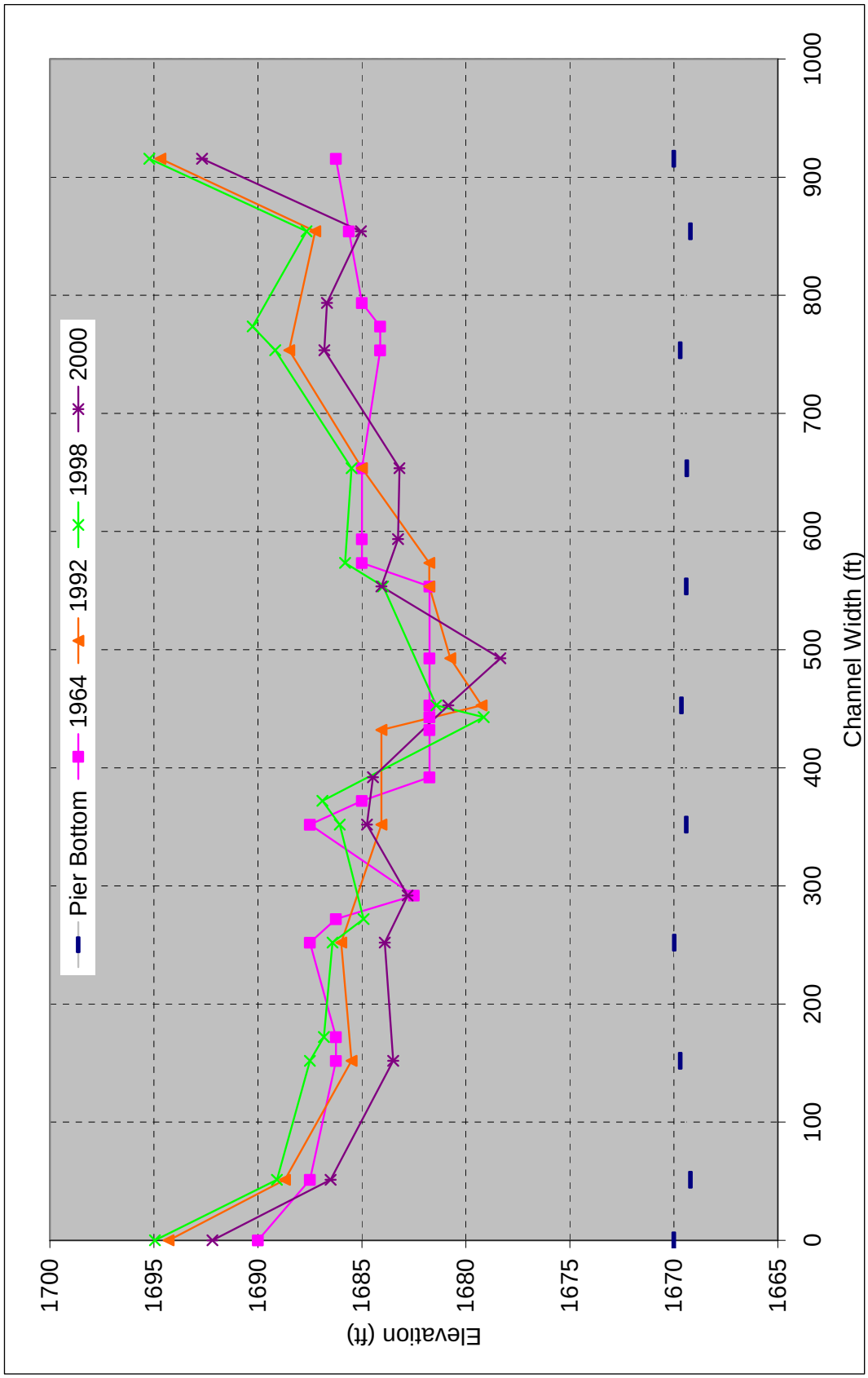



**Figure 17. Cross-section at bridge (Key No. 16193 and RS 5) on US 60, North Canadian River, OK**

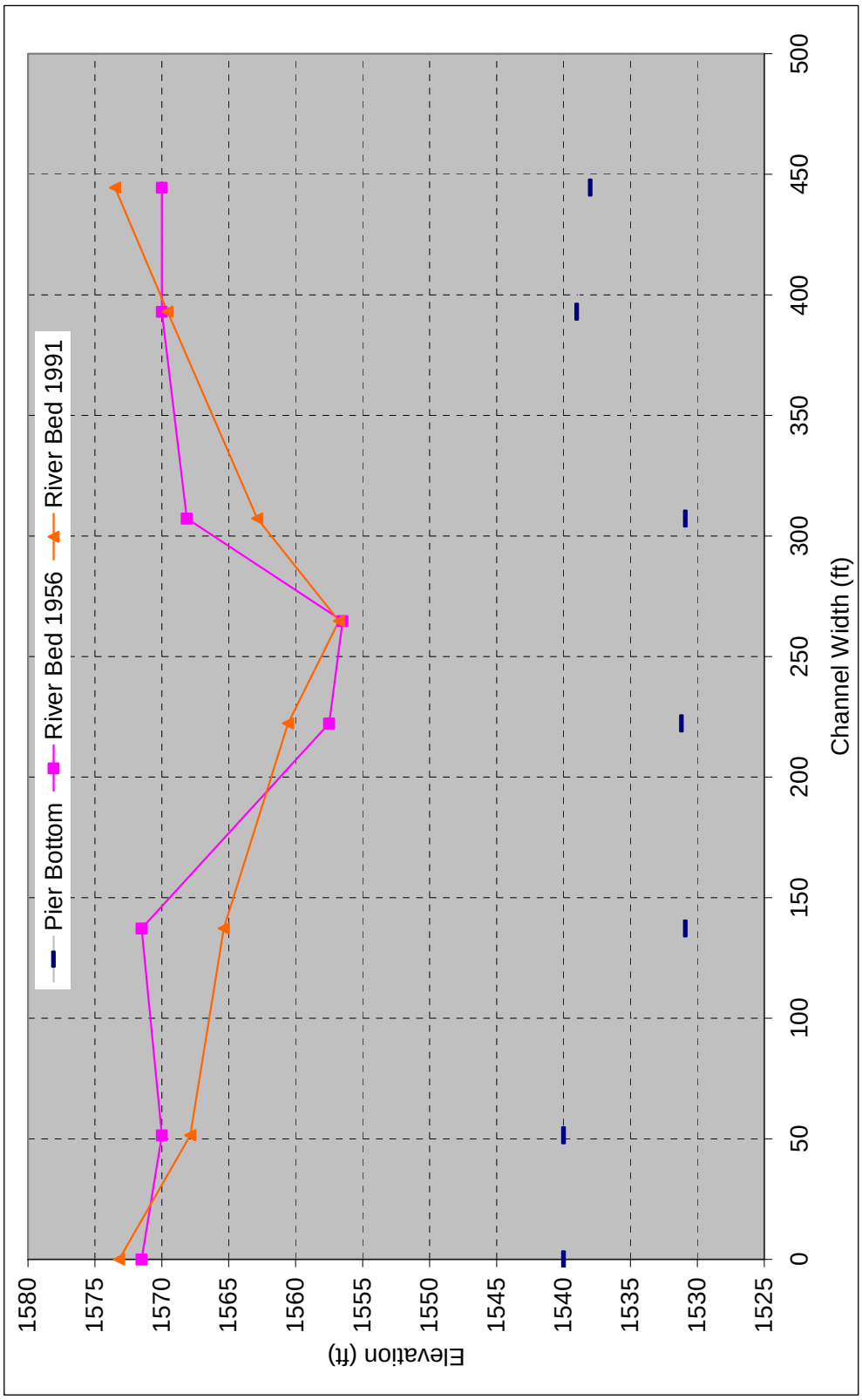



**Figure 18. Cross-section at bridge (Key No. 13679 and RS 6) on SH 51, North Canadian River, OK**

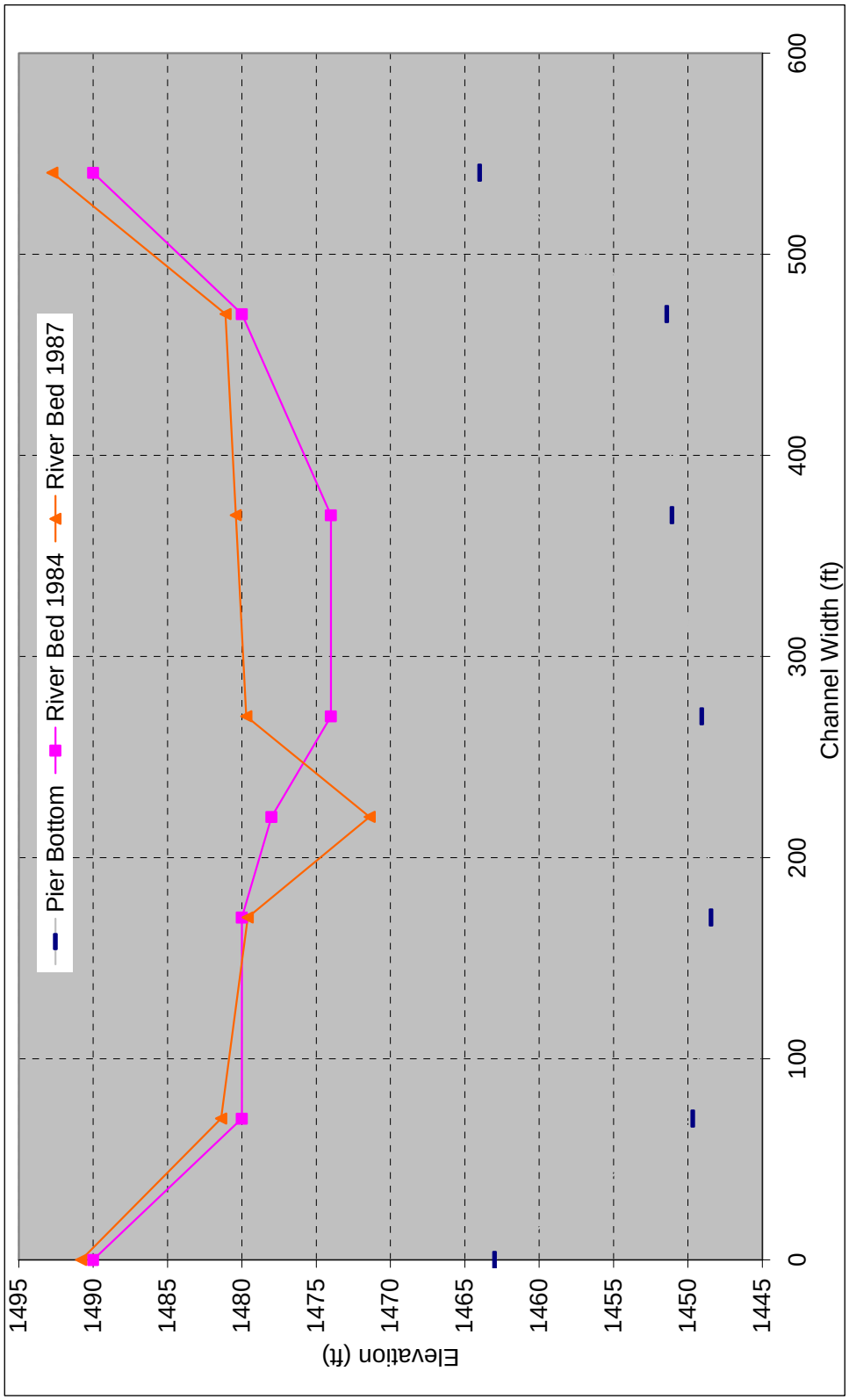



**Figure 19. Cross-section at bridge (Key No. 20864 and RS 8) on US 270, North Canadian River, OK**

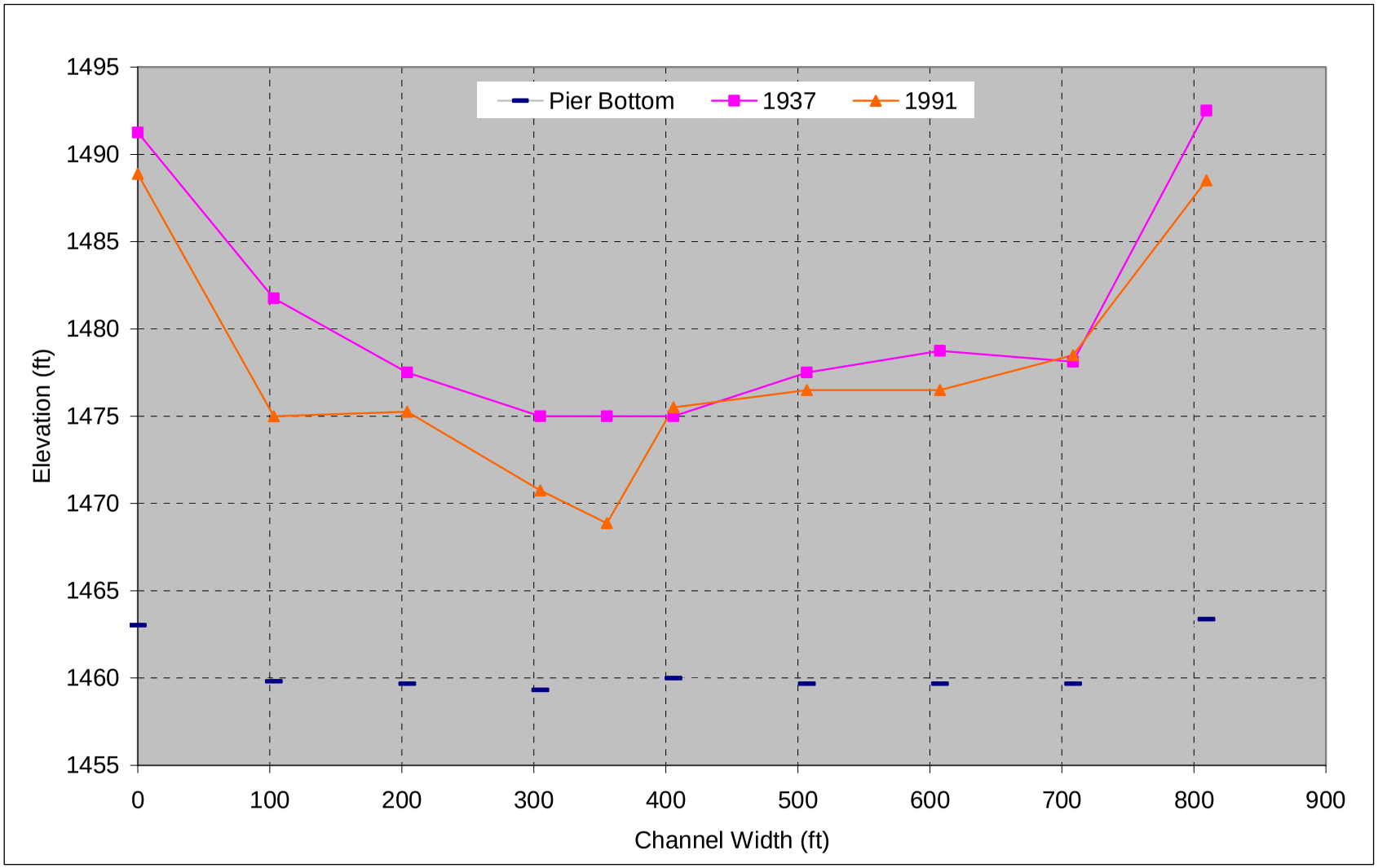



**Figure 20. Cross-section at bridge (Key No. 05523 and RS 9) on US 270, North Canadian River, OK**

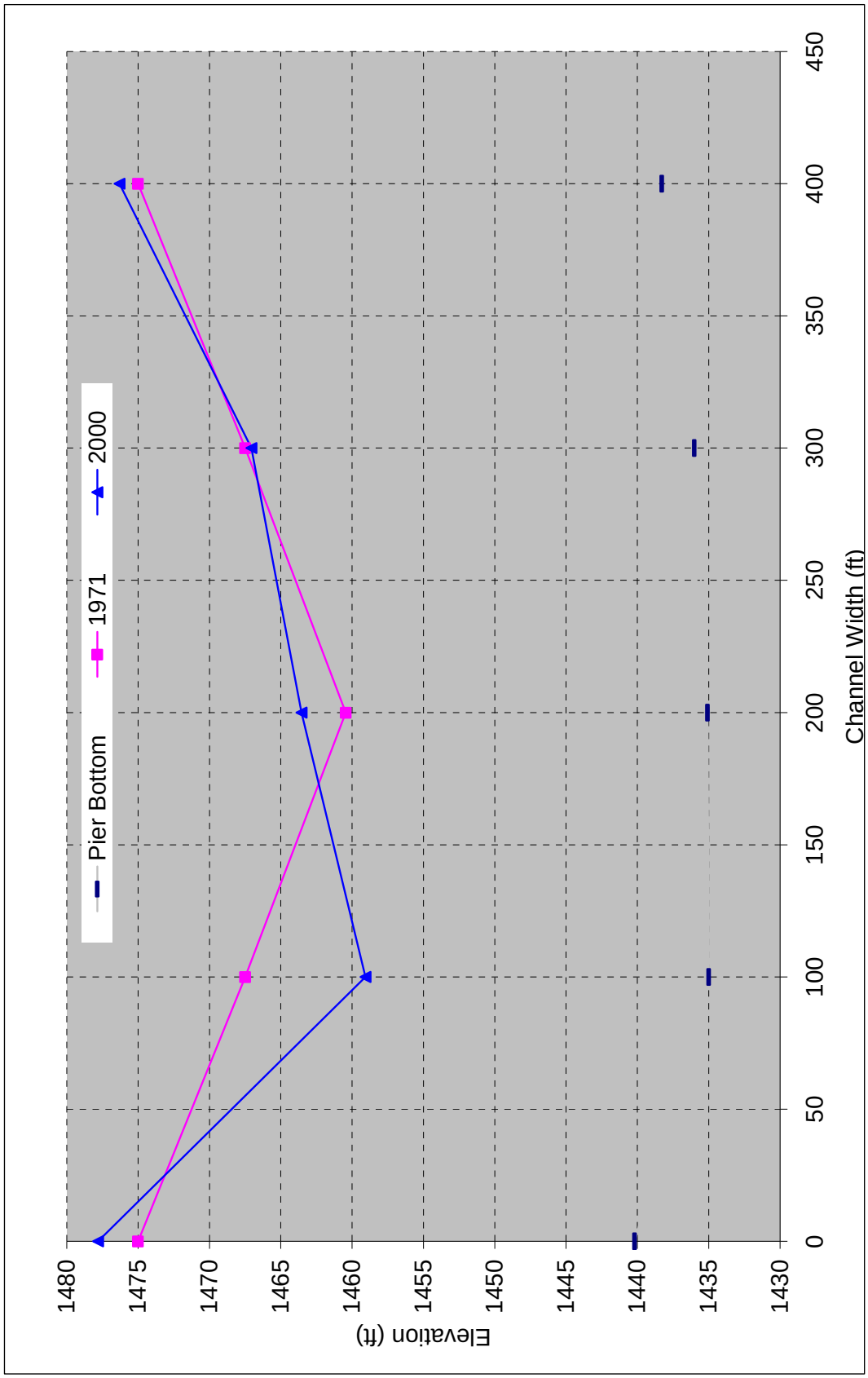



**Figure 21. Cross-section at bridge (Key No. 18134 and RS 10) on US 270, North Canadian River, OK**

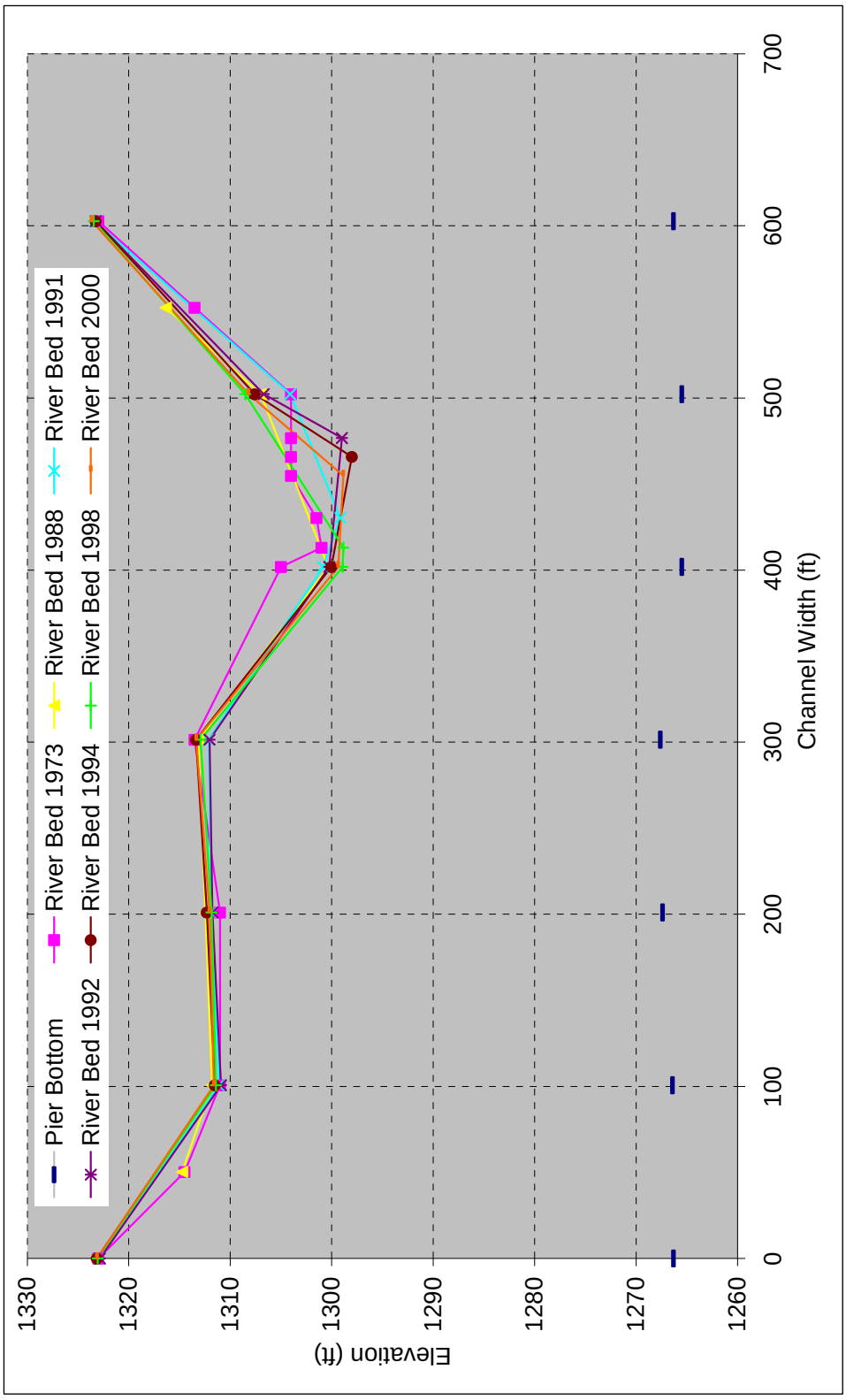



**Figure 22. Cross-section at bridge (Key No. 18608 and RS 12) on US 81, North Canadian River, OK**

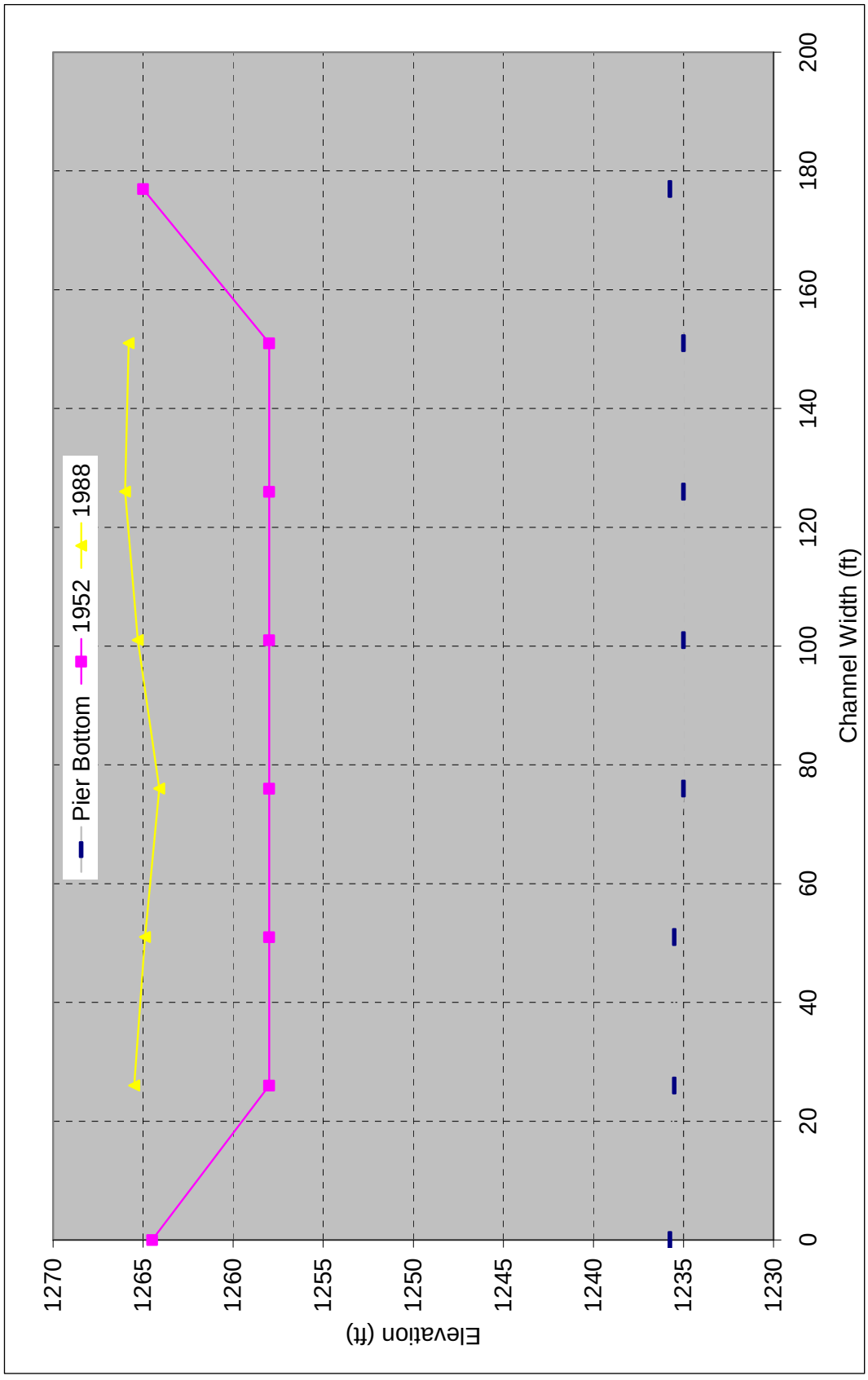



**Figure 23. Cross-section at bridge (Key No. 12832 and RS 13) on SH 4, North Canadian River, OK**

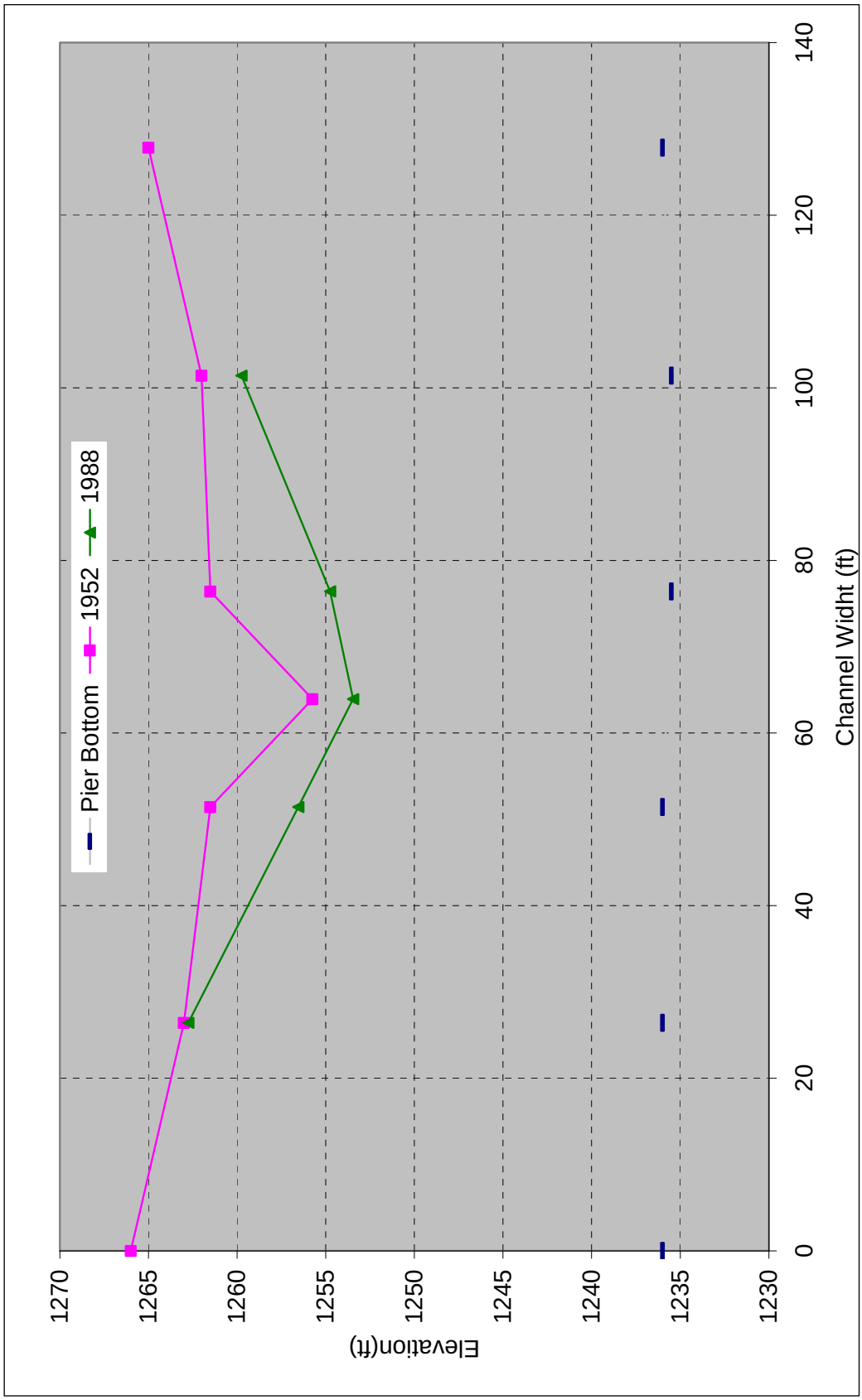



**Figure 24. Cross-section at bridge (Key No. 12820 and RS 14) on SH 4, North Canadian River, OK**

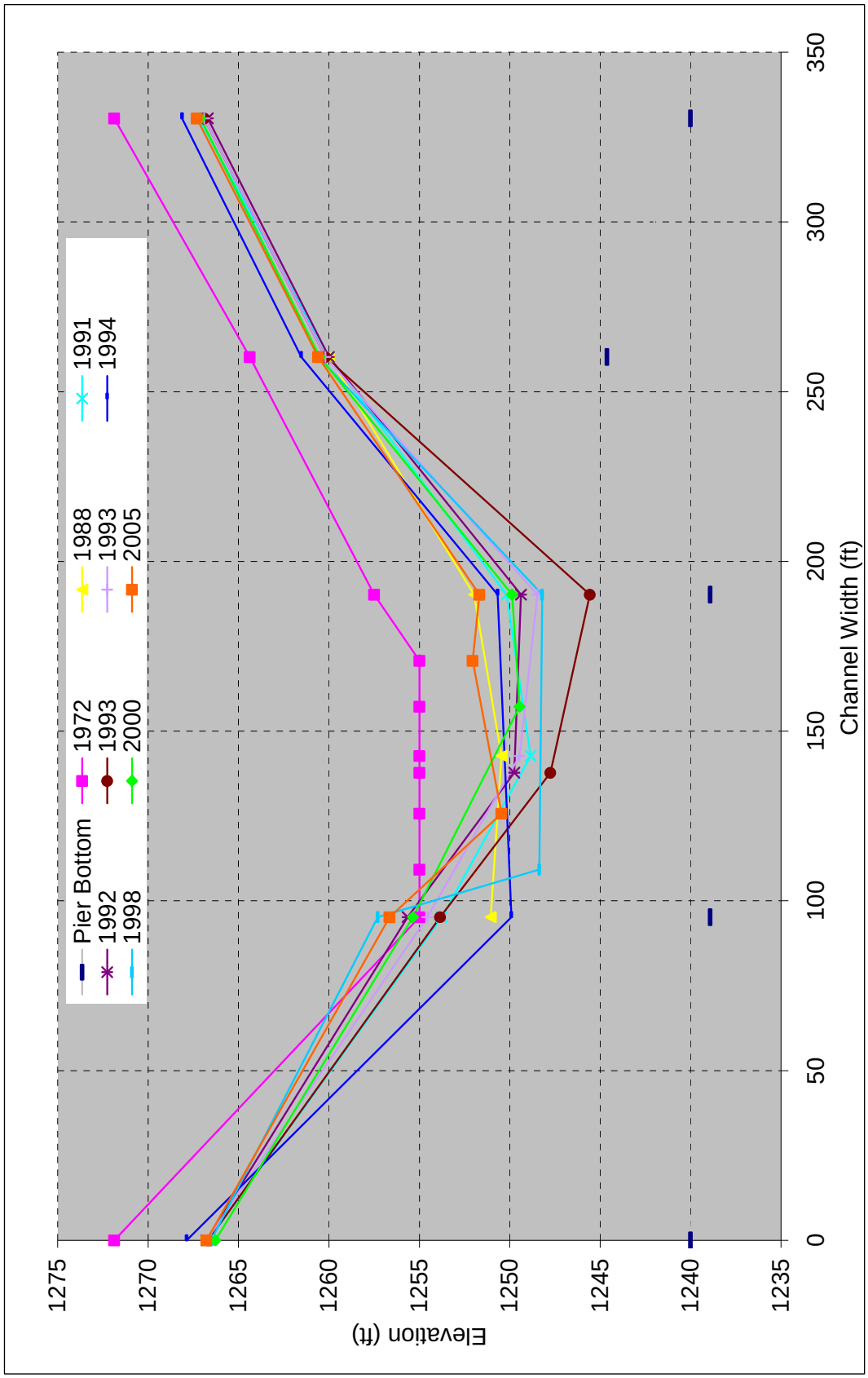



**Figure 25. Cross-section at bridge (Key No. 18352 and RS 15) on SH 4, North Canadian River, OK**

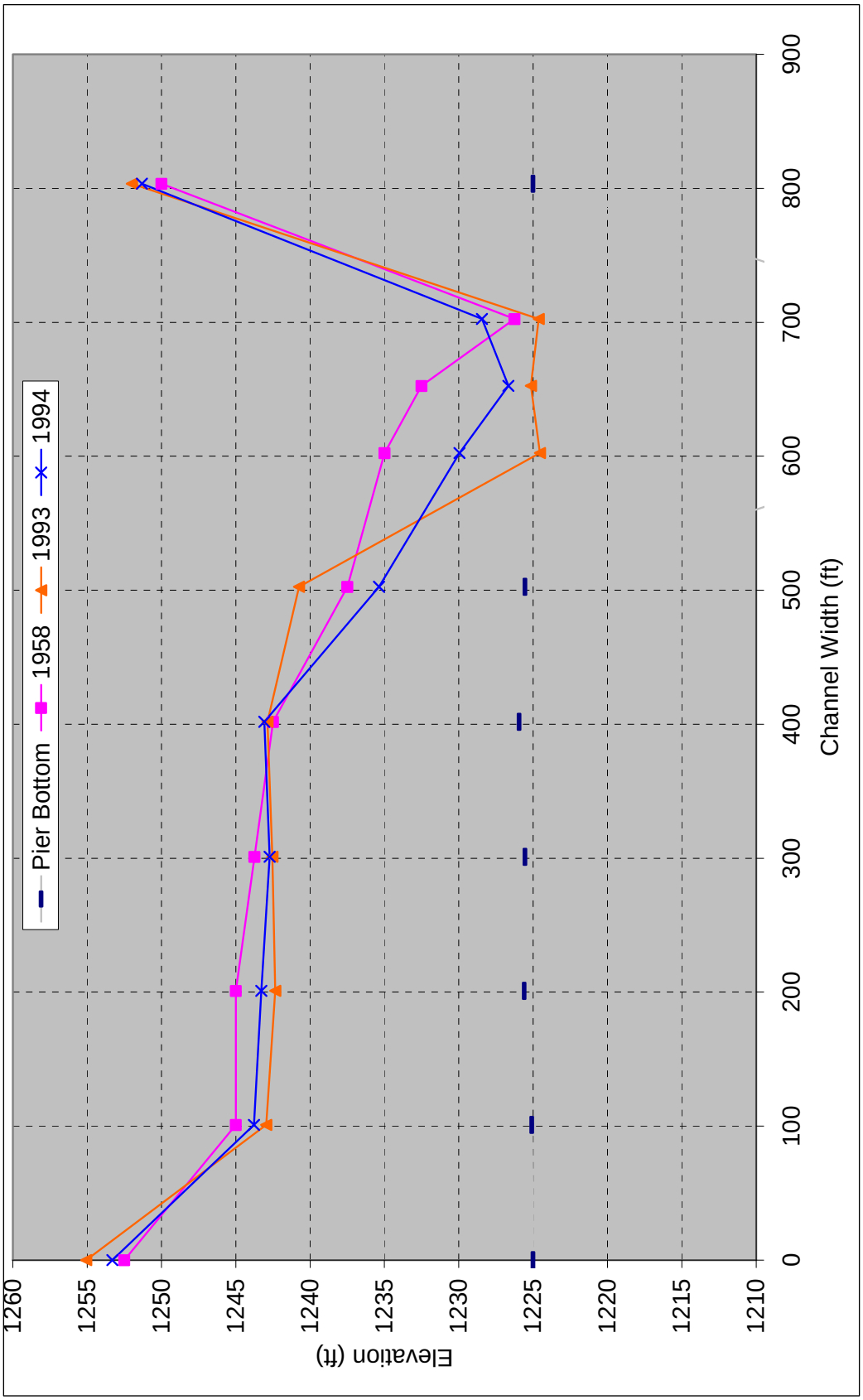



**Figure 26. Cross-section at bridge (Key No. 14208 and RS 16) on US 66, North Canadian River, OK**

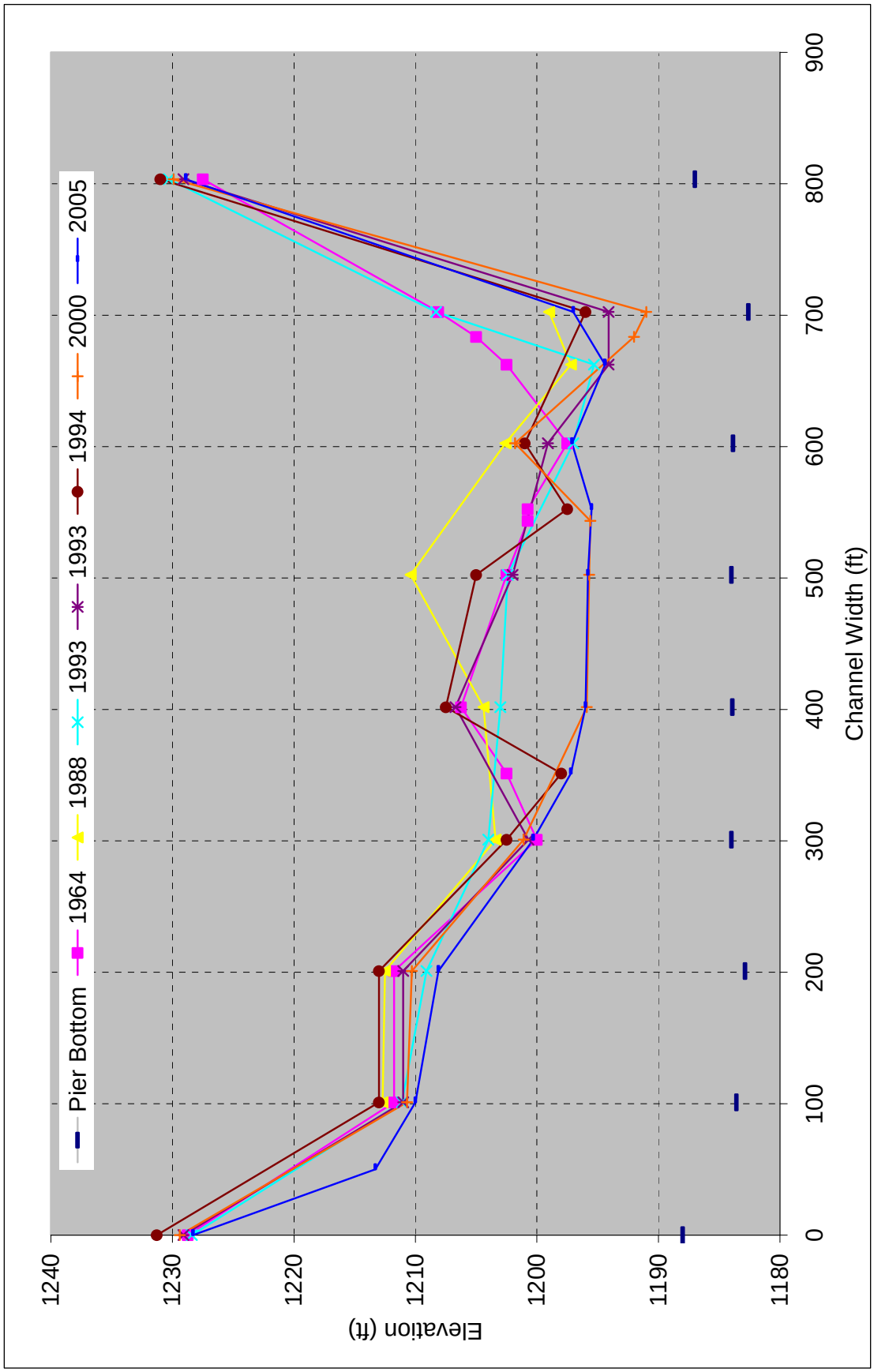



**Figure 27. Cross-section at bridge (Key No. 16189 and RS 17) on I-40, North Canadian River, OK**

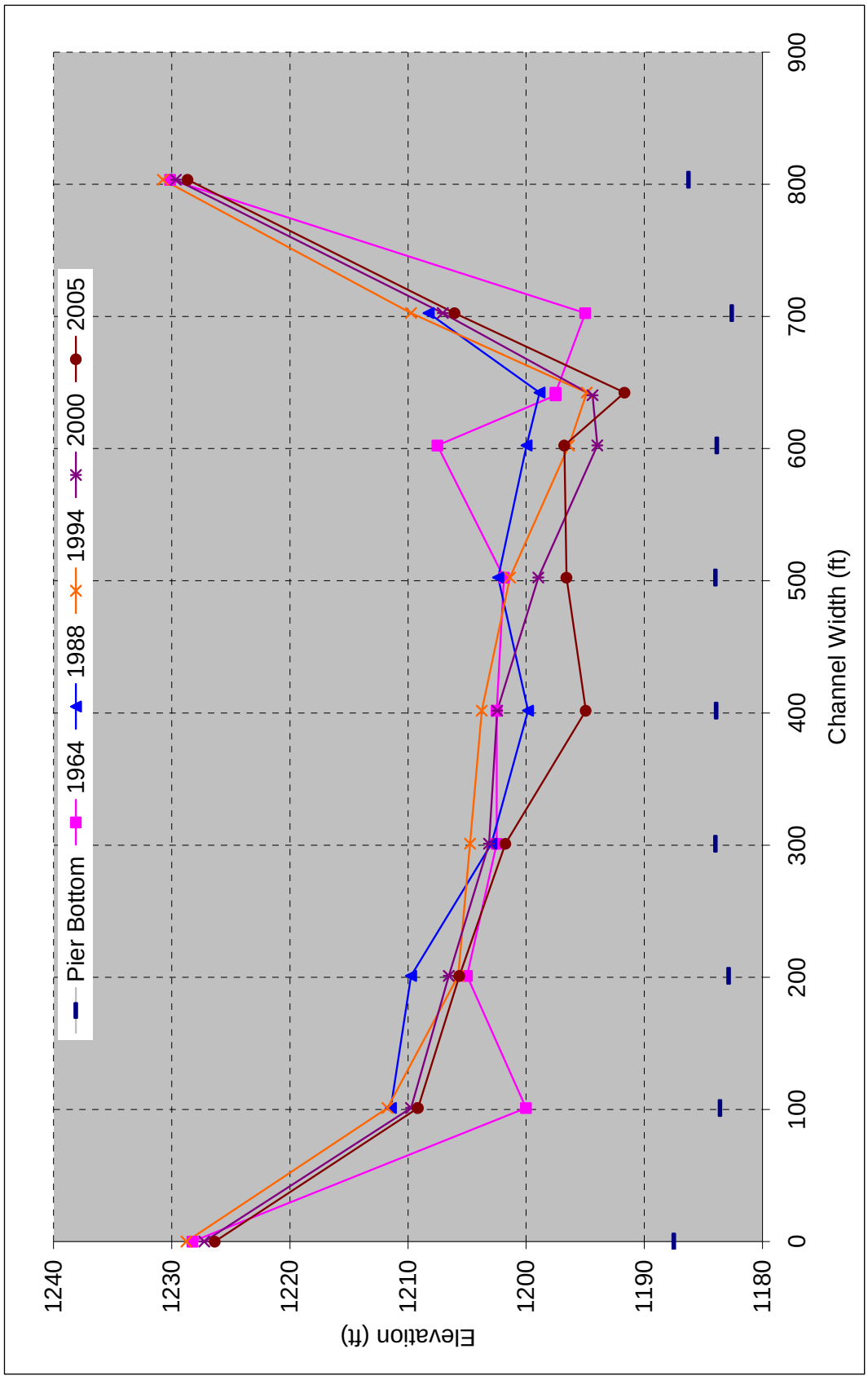



**Figure 28. Cross-section at bridge (Key No. 16190 and RS 18) on I-40, North Canadian River, OK**

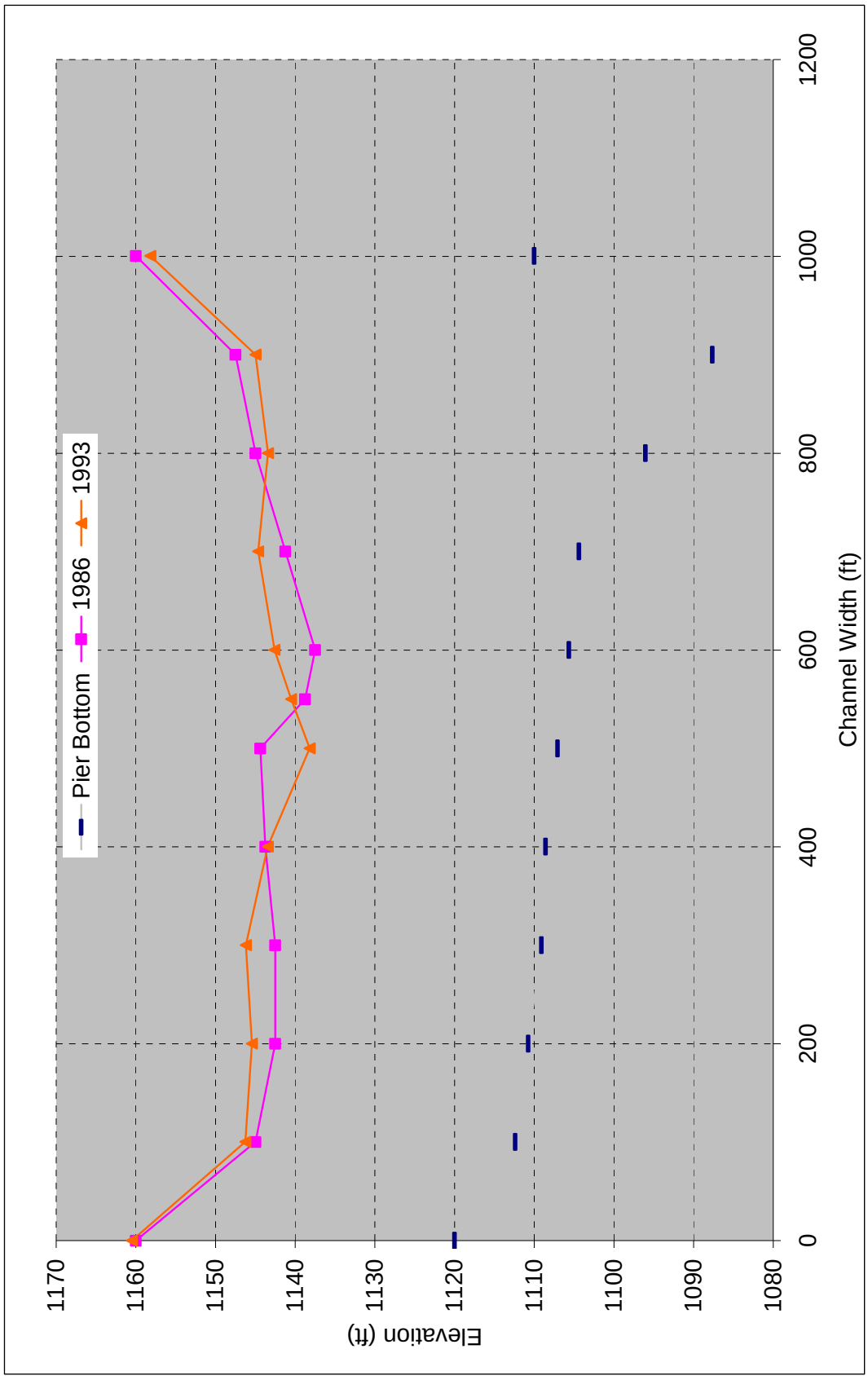



**Figure 29. Cross-section at bridge (Key No. 21357 and RS 20) on US 69, North Canadian River, OK**

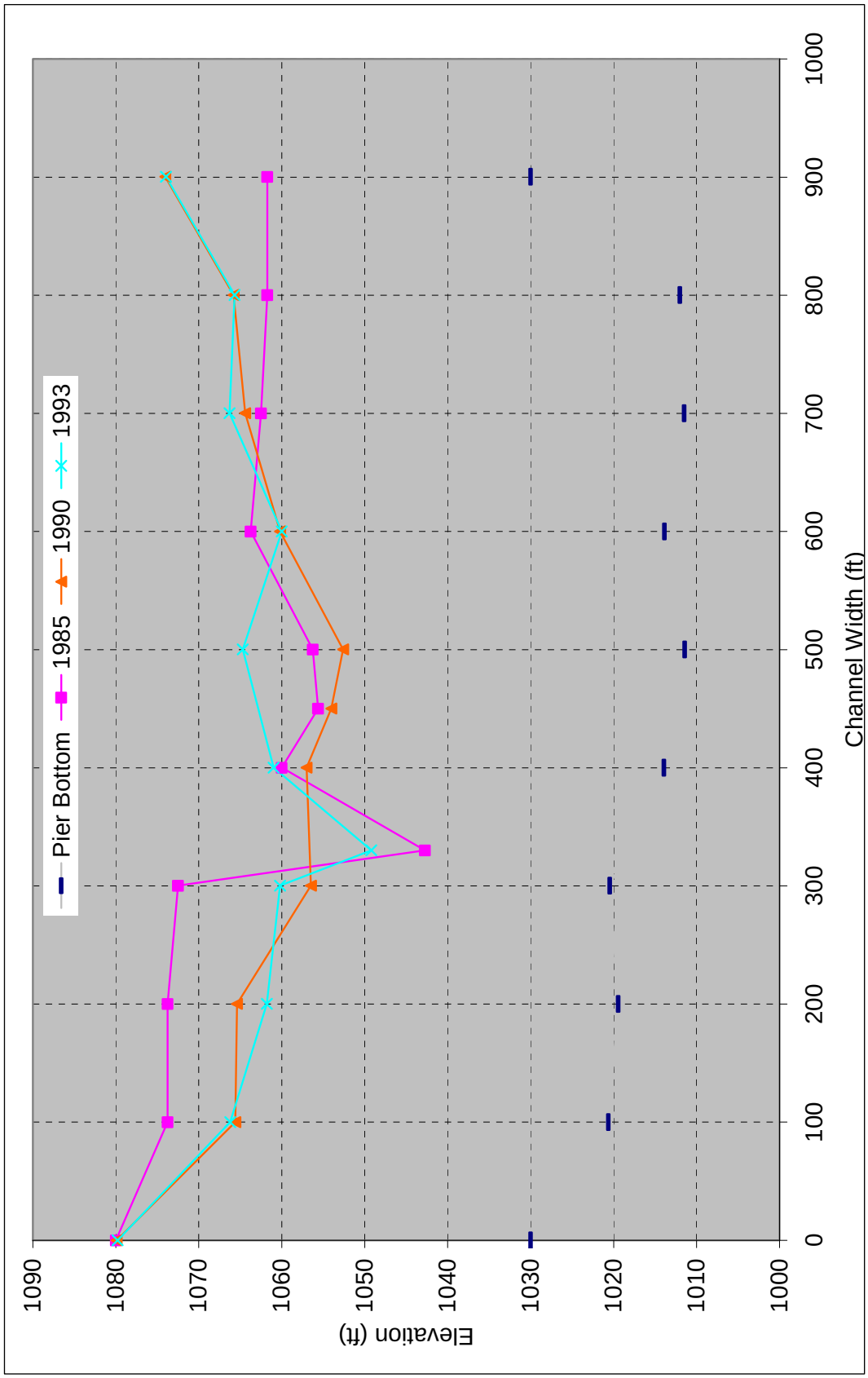



**Figure 30. Cross-section at bridge (Key No. 21129 and RS 21) on US 62, North Canadian River, OK**

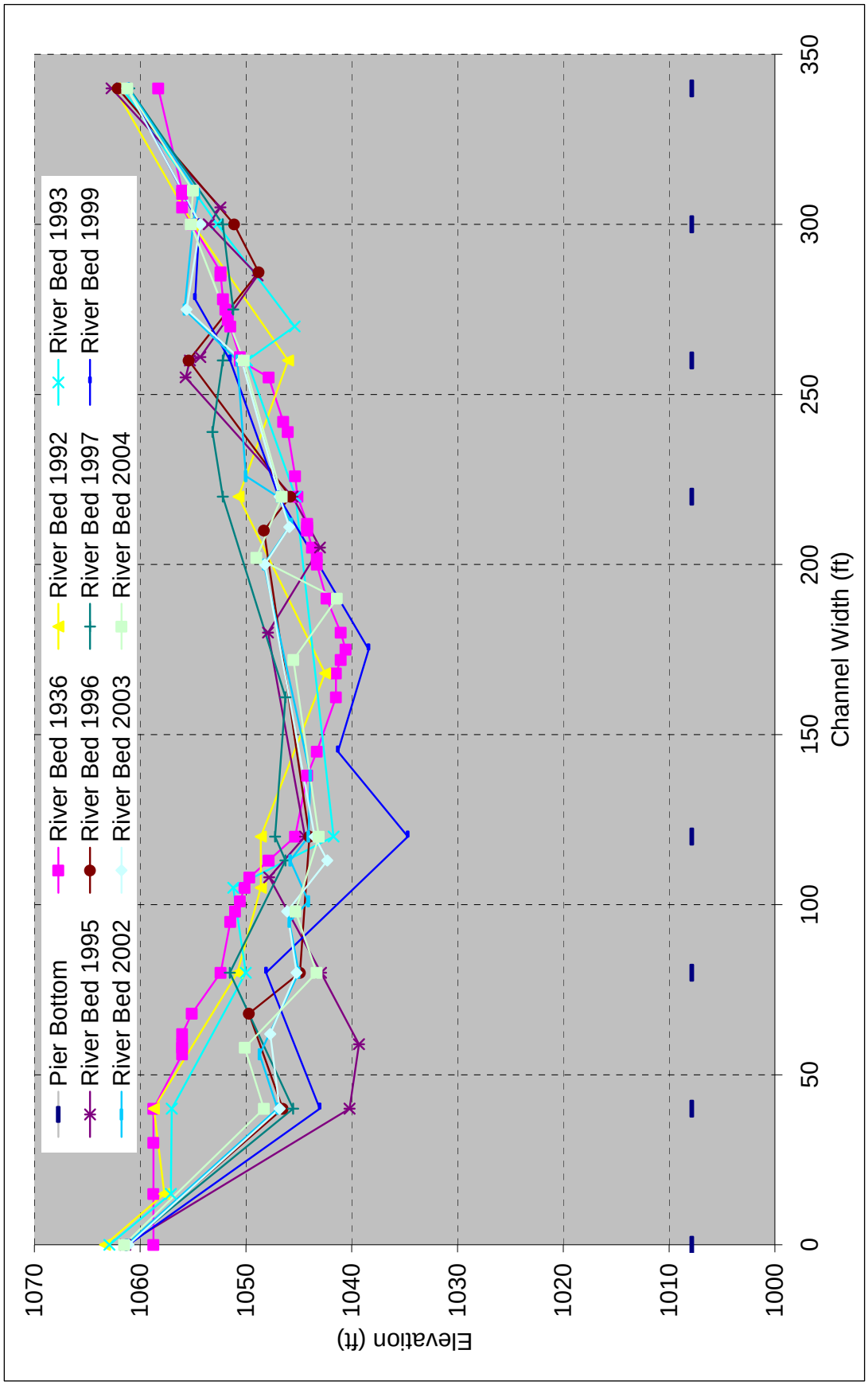



**Figure 31. Cross-section at bridge (Key No. 05040 and RS 22) on SH 102, North Canadian River, OK**

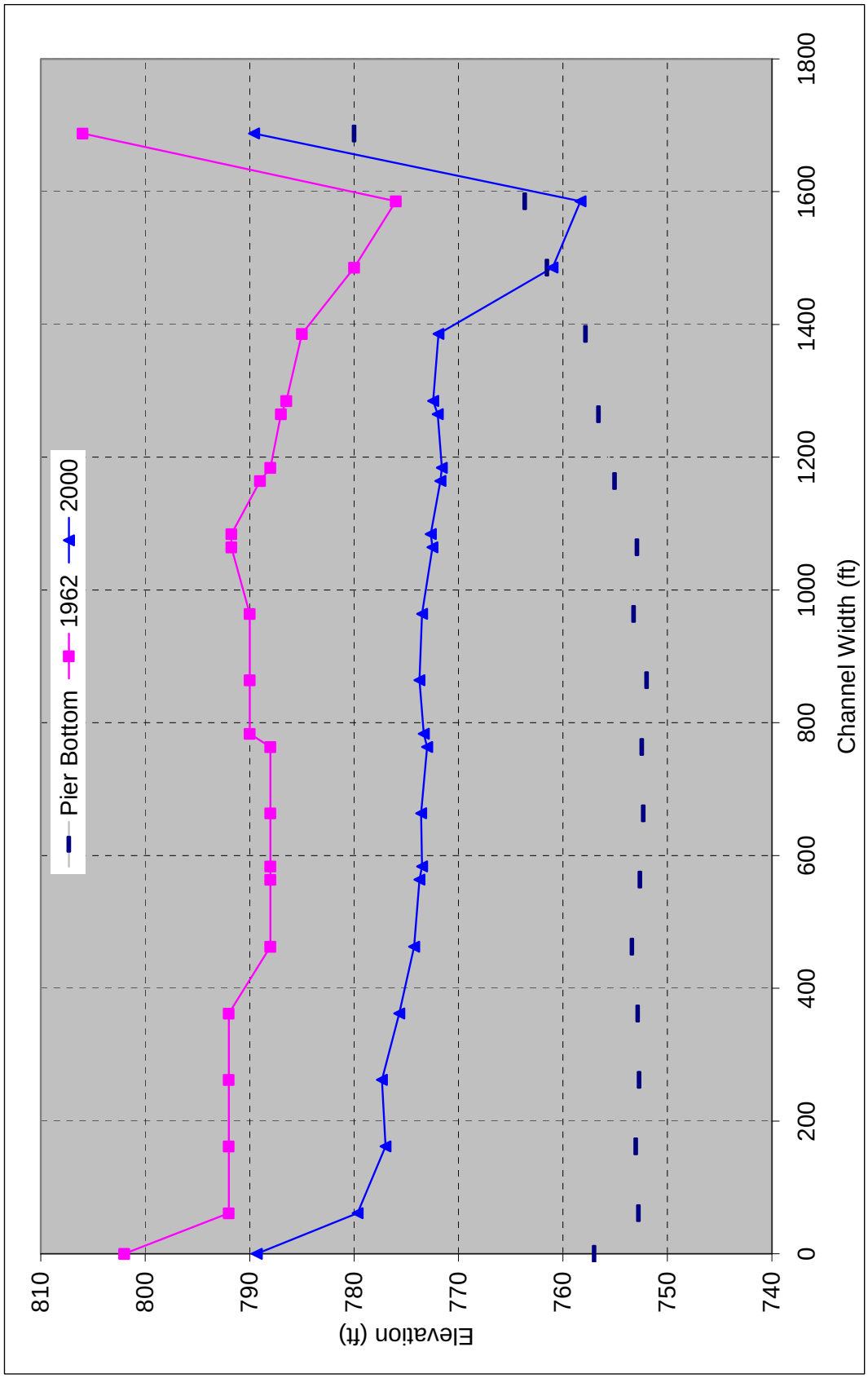



**Figure 32. Cross-section at bridge (Key No. 15870 and RS 33) on I-20, North Canadian River, OK**

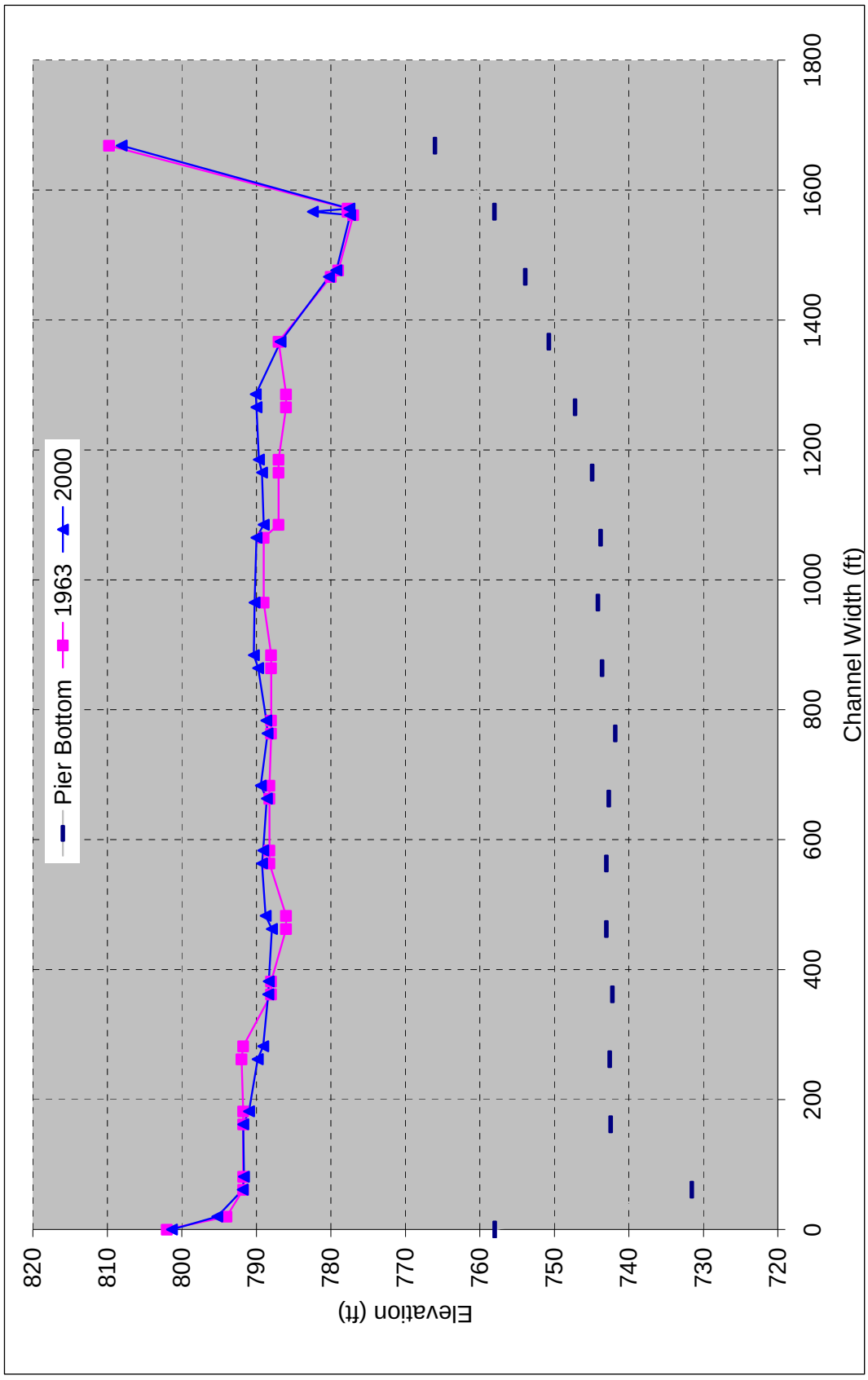



**Figure 33. Cross-section at bridge (Key No. 15871 and RS 34) on I-40, North Canadian River, OK**

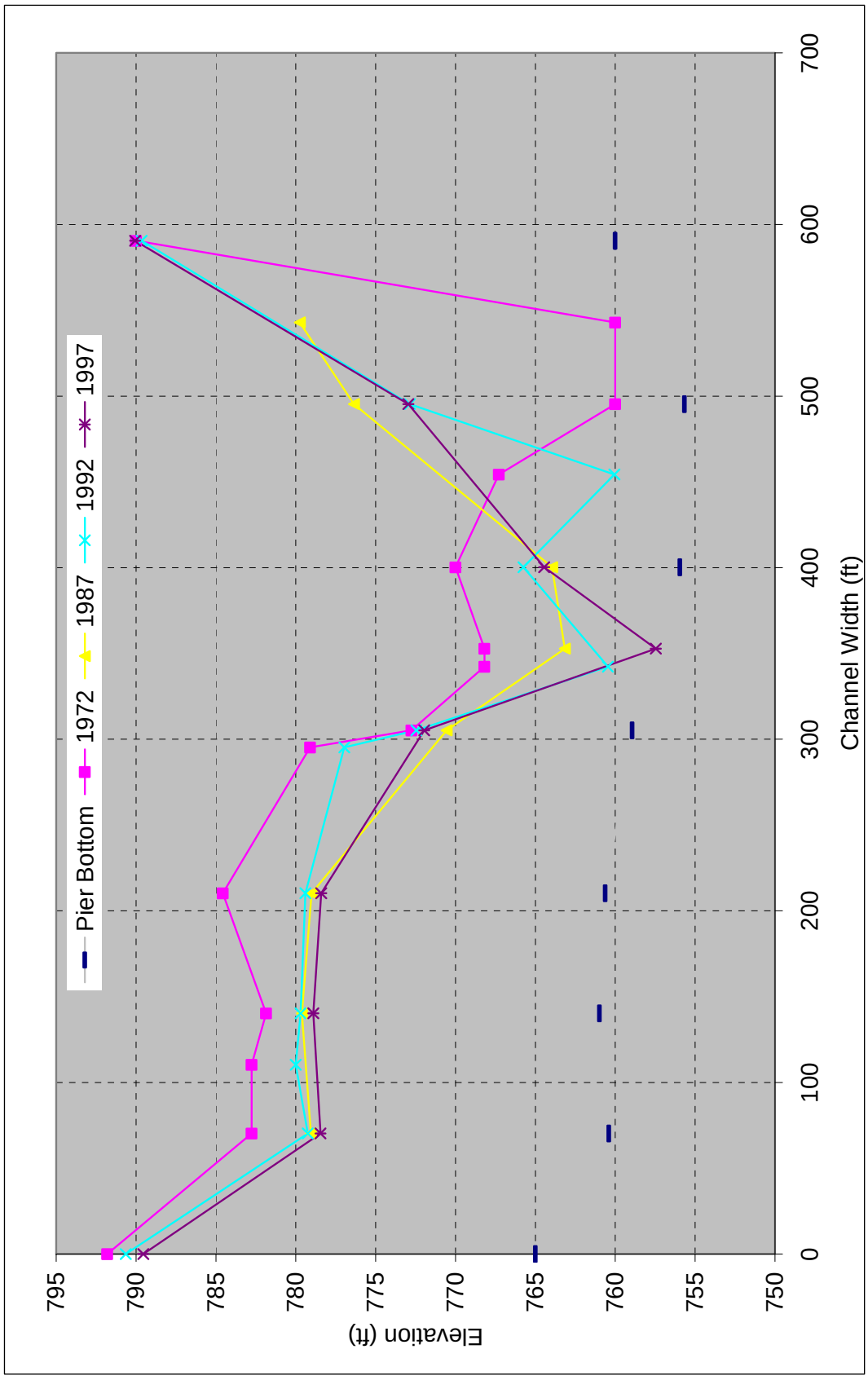



**Figure 34. Cross-section at bridge (Key No. 18361 and RS 35) on S.H.48, North Canadian River, OK**

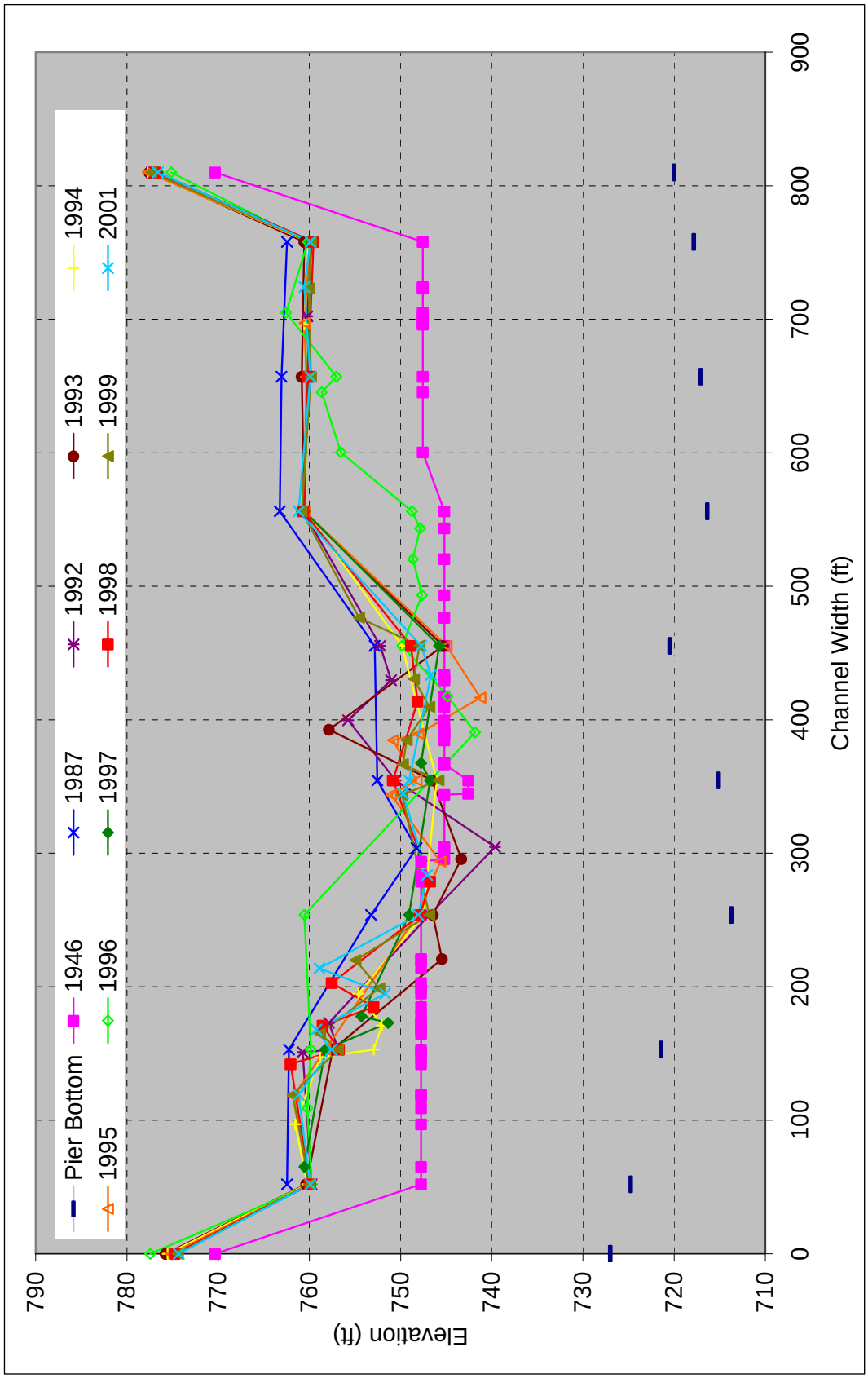



**Figure 35. Cross-section at bridge (Key No. 10570 and RS 36) on S.H.27, North Canadian River, OK**

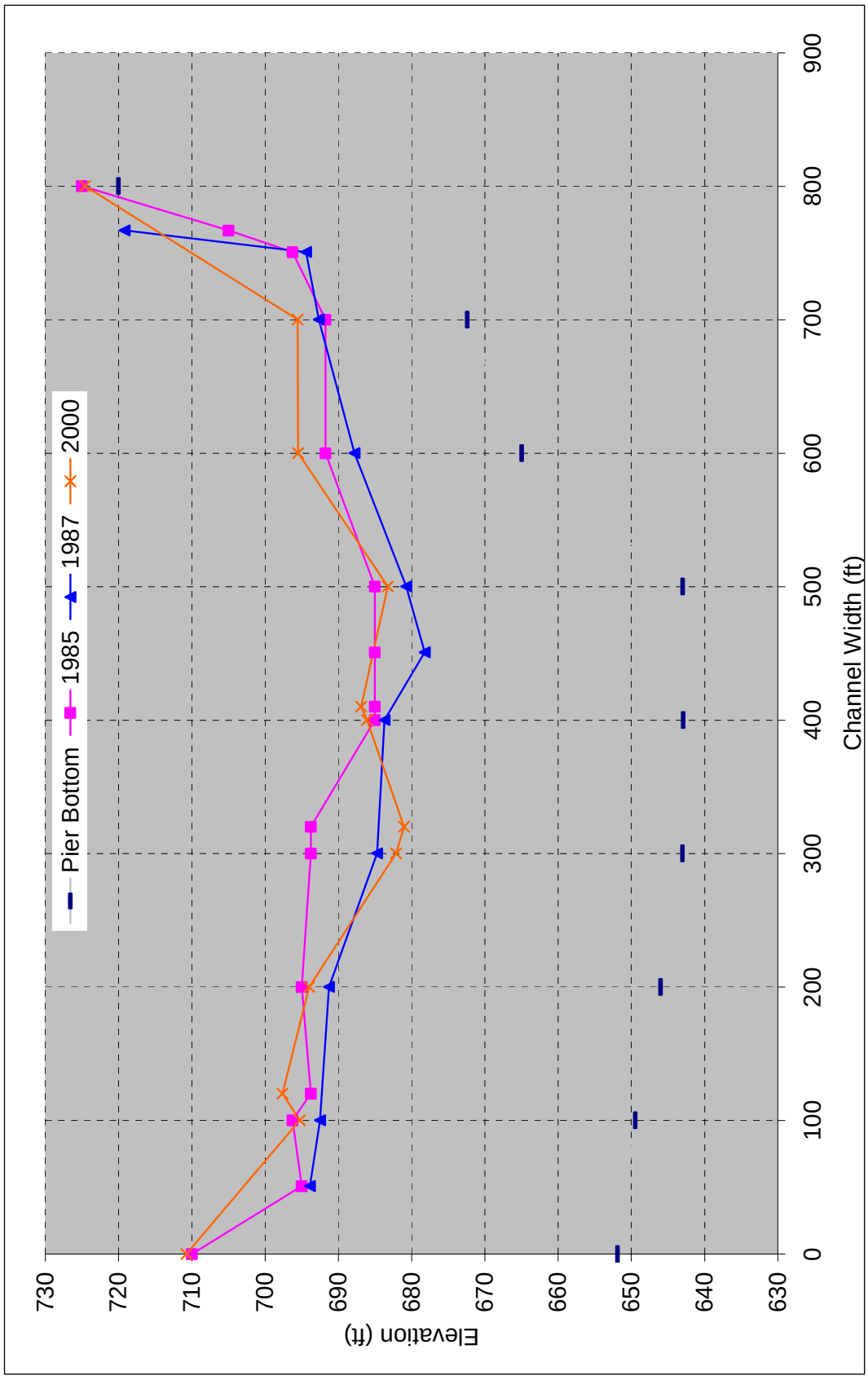



**Figure 36. Cross-section at bridge (Key No. 21128 and RS 37) on U.S.75, North Canadian River, OK**

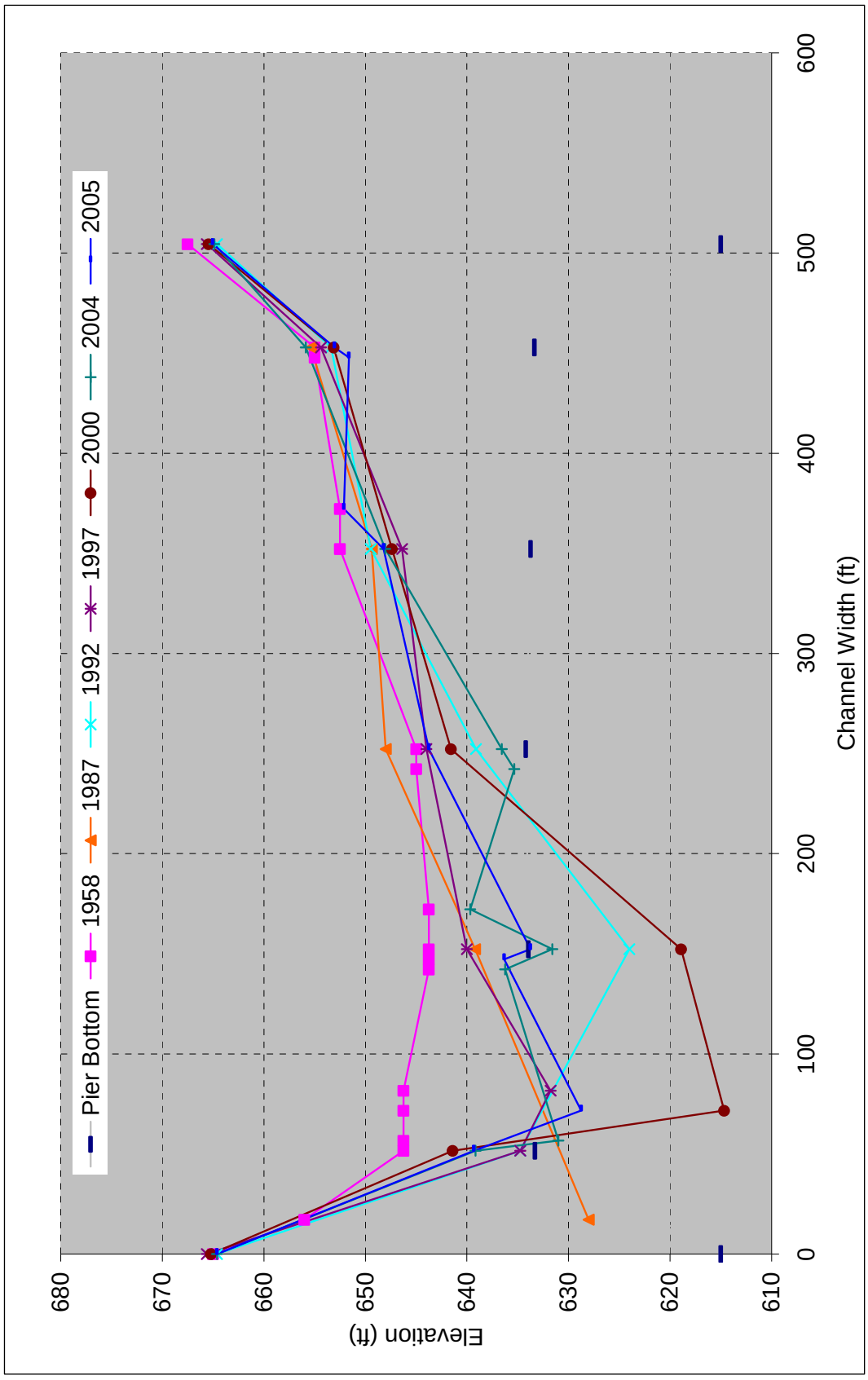



**Figure 37. Cross-section at bridge (Key No. 14200 and RS 39) on S.H. 84, North Canadian River, OK**

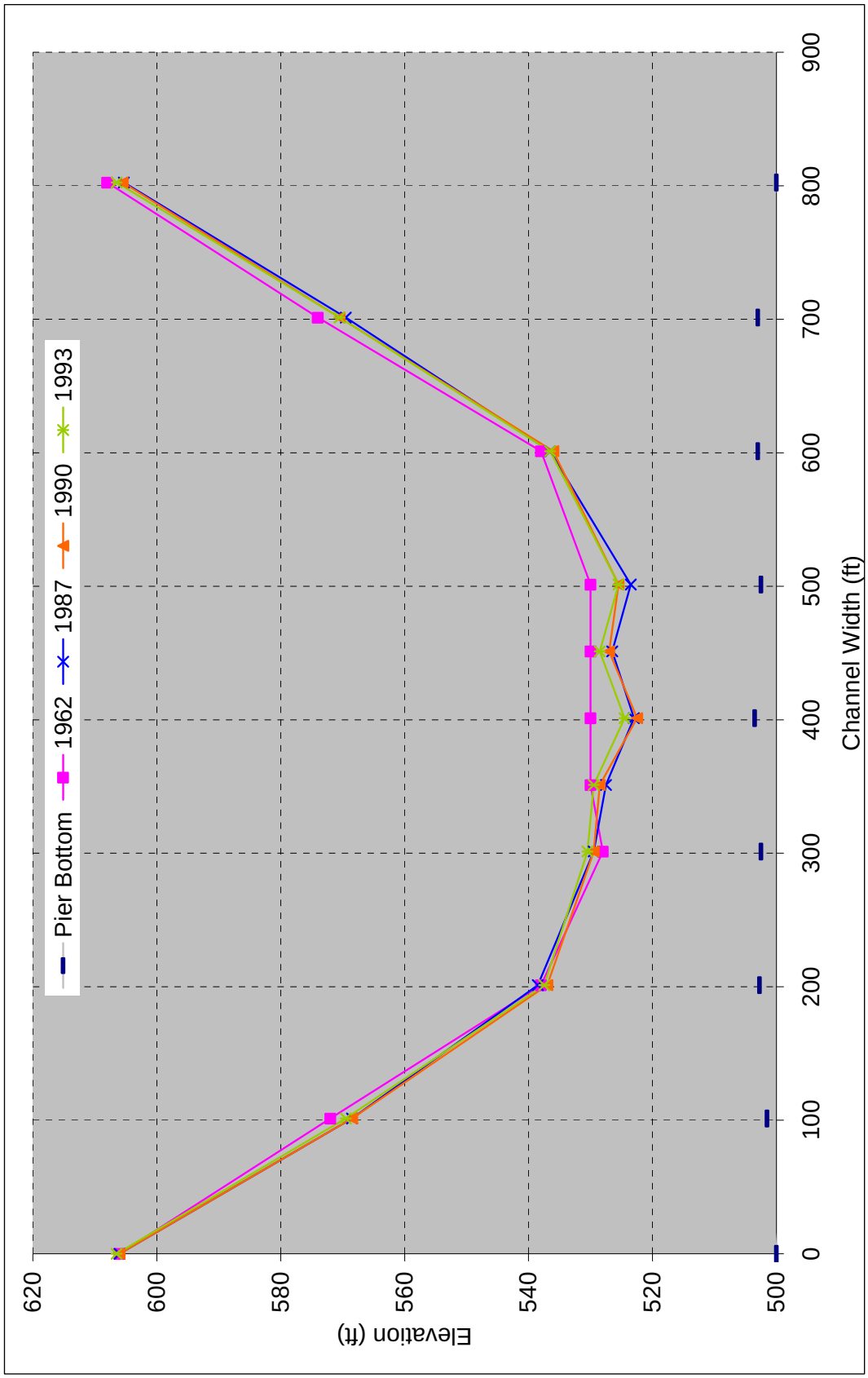



**Figure 38. Cross-section at bridge (Key No. 15585 and RS 40) on U.S. 69, North Canadian River, OK**

## V. ANALYSIS OF FLOWLINE PROFILE

The rate of channel-bed elevation changes was estimated as the net difference in channel-bed elevation between the starting and ending dates divided by total duration of time between the two dates (Table 3). The trend line of bed-elevation changes (Fig.39) was plotted for study Reach 1, 2, and 3. Reach 1 and 2 are at upstream of Eufaula Lake dam and Reach 3 is at downstream of Eufaula Lake dam respectively. The best fit line for the stream bed elevation change rate (Fig. 40) is also plotted.

Flowlines at each river station were interpolated for 5 year intervals (Table 4) and longitudinal profiles of flowlines were then plotted in Microsoft Excel (Fig. 41). Twenty five miles of river reach is plotted separately in each sheet for the evaluation of channel-bed elevation changes (Fig. 42-61).

In the study reach, at RS 6 and RS 7, 3.69 miles downstream the Canton Lake Dam aggradation is observed. Aggradation at the short downstream point of the dam is an uncharacteristic phenomenon. But according to the study conducted by Grant and Schmidt (2003), if the ratio of sediment supply below the dam to the sediment supply above the dam is largely greater than 1, then channel aggradation occurs downstream of the dam. RS 17 at the crossing of I-40, which is 1.69 miles downstream of the Lake Overholser Dam, shows the degradation of 5 feet in 41 years.

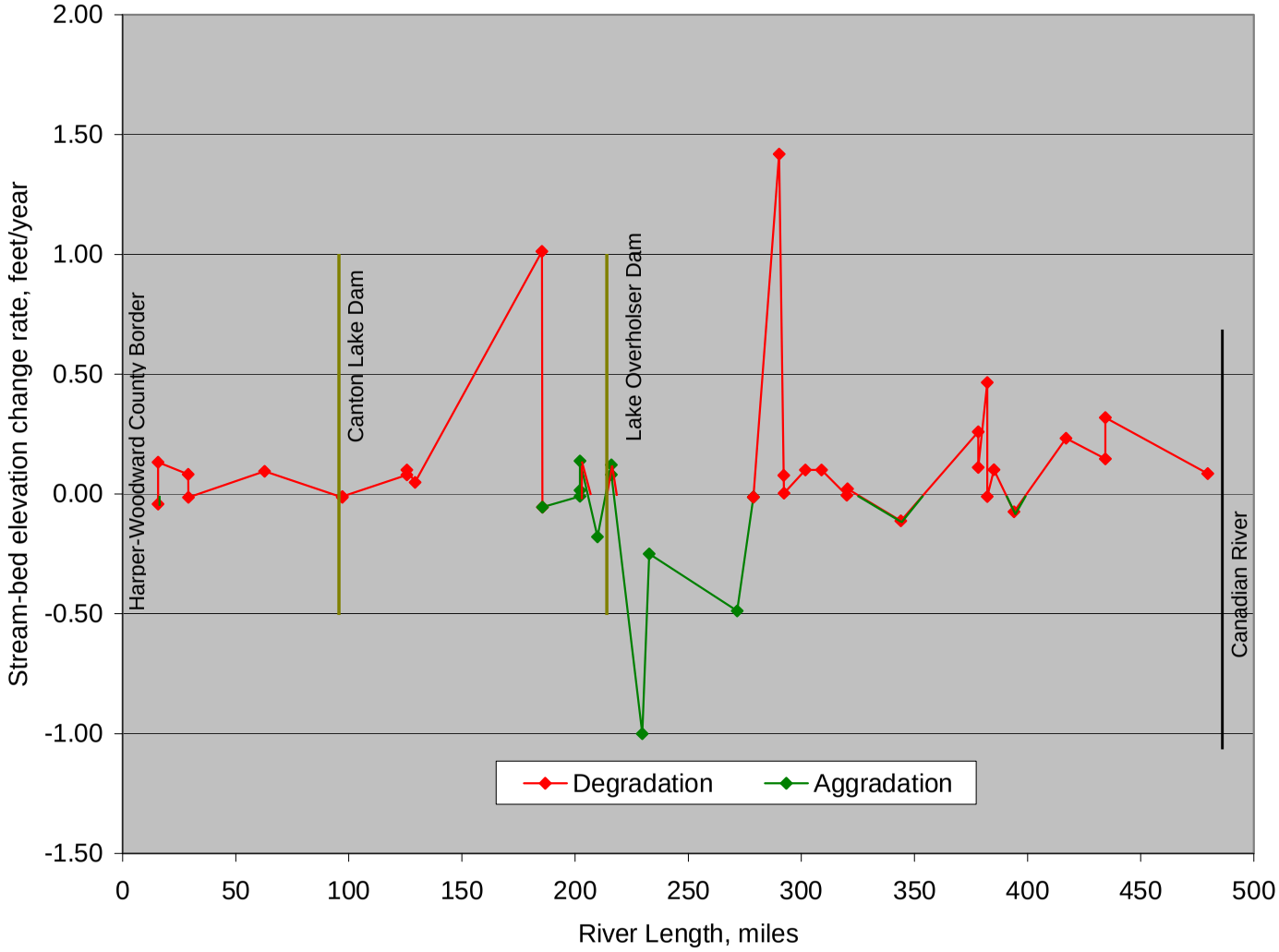



**Figure 39. Trend line of stream-bed elevation changes**

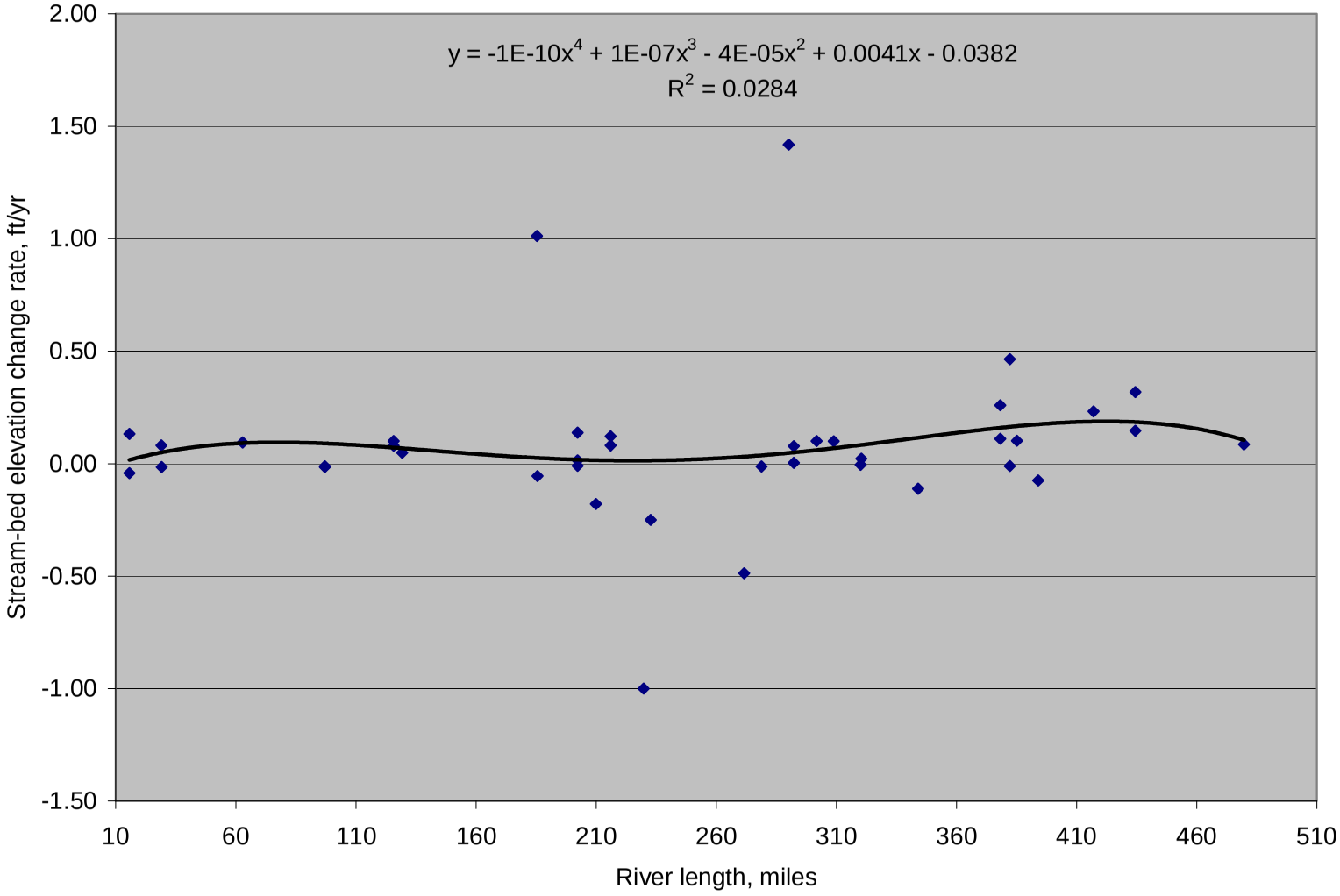



**Figure. 40. The best fit line of stream-bed elevation change rate (ft/yr) versus river length in miles**

**Table 3. Summary- channel –bed elevation change, North Canadian River**

| BRI_key | River Station | Miles | Highway | Bridge Installed | Stratum | Max. Scour** (ft) | Duration (yr) | Scour Rate** (ft/yr) |
|---|---|---|---|---|---|---|---|---|
| *b16523 | RS1 | 15.72 | S.H.34 | 1965 | Sand to Medium Hard Red Bed | -1.10 | 26 | -0.042 |
| b16642 | RS2 | 15.72 | S.H.34 | 1965 | Sand to Medium Hard Red Bed | 4.63 | 35 | 0.1321 |
| *b17509 | RS3 | 29.05 | S.H. 50 | 1969 | Sand to Soft Red Bed | -0.31 | 22 | -0.0142 |
| b17602 | RS4 | 29.15 | S.H. 50 | 1969 | Sand to Soft Red Bed | 2.78 | 34 | 0.0816 |
| b16193 | RS5 | 62.82 | U.S. 60 | 1964 | Sand to Medium Hard Shale | 3.40 | 36 | 0.0944 |
| b13679 | RS6 | 97.12 | S.H. 51 | 1956 | Sand to Red Bed | -0.68 | 48 | -0.0142 |
| *b13655 | RS7 | 97.12 | S.H. 51 | 1956 | Sand to Red Bed | -0.50 | 46 | -0.0109 |
| b20864 | RS8 | 125.64 | U.S. 270 | 1984 | Sand to Red Bed | 1.60 | 20 | 0.0800 |
| b05523 | RS9 | 125.67 | U.S. 270 | 1937 | Sand to Red Bed | 5.83 | 58 | 0.1005 |
| b18134 | RS10 | 129.29 | U.S. 270 | 1971 | Sand to Medium Hard Sale | 1.40 | 29 | 0.0483 |
| *b26237 | RS11 | 185.37 | U.S. 81 | 2000 | Sand to Medium Hard Red Bed | 5.06 | 5 | 1.0125 |
| b18608 | RS12 | 185.57 | U.S. 81 | 1973 | Sand to Medium Hard Red Bed | -1.75 | 32 | -0.0547 |
| b12832 | RS13 | 202.22 | S.H. 4 | 1952 | Medium Packed Sand to Shale | -0.50 | 53 | -0.0094 |
| b12820 | RS14 | 202.22 | S.H. 4 | 1952 | Sand to Rock Sand | 0.80 | 53 | 0.0151 |
| b18352 | RS15 | 202.22 | S.H.4 | 1972 | Sand to Red Bed | 4.55 | 33 | 0.1379 |

**Table 3. (Continued)**

| BRI_key | River Station | Miles | Highway | Bridge Installed | Stratum | Max. Scour** (ft) | Duration (yr) | Scour Rate** (ft/yr) |
|---|---|---|---|---|---|---|---|---|
| b14208 | RS16 | 209.88 | U.S. 66 | 1958 | Sand to Red Bed | -8.40 | 47 | -0.1787 |
| b16189 | RS17 | 216.03 | I-40 | 1964 | Sand to Red Bed | 5.00 | 41 | 0.1220 |
| b16190 | RS18 | 216.04 | I-40 | 1964 | Sand to Red Bed | 3.33 | 41 | 0.0812 |
| *b27867 | RS19 | 229.72 | I-40 WB TO I-35 NB | 2003 | Sand to Sand Stone | -2.00 | 2 | -1.0000 |
| b21357 | RS20 | 232.75 | U.S. 62 | 1986 | Sand to Sand Stone | -4.75 | 19 | -0.2500 |
| b21129 | RS21 | 271.65 | U.S. 62 | 1985 | Sand to Sand Stone | -9.75 | 20 | -0.4875 |
| b05040 | RS22 | 278.83 | S.H. 102 | 1936 | Sand | -0.83 | 68 | -0.0122 |
| *b20576 | RS23 | 290.19 | S.H. 270 | 1983 | Sand to Soft Sandy Clay | 15.60 | 11 | 1.4182 |
| *b15380 | RS24 | 292.30 | I-40 | 1961 | Sand to Red Bed | 2.03 | 26 | 0.0781 |
| *b15381 | RS25 | 292.31 | I-40 | 1961 | Sand to Hard Sand Stone | 0.09 | 26 | 0.0035 |
| *b15388 | RS26 | 301.79 | U.S. 270 | 1961 | Sand to Red Bed | 4.43 | 44 | 0.1007 |
| *b19276 | RS27 | 308.91 | S.H.-3E | 1976 | Fine Sand to Hard Shale | 2.70 | 27 | 0.1000 |
| *b15865 | RS28 | 320.10 | N/A | 1962 | Clay to Shale | -0.17 | 33 | -0.0052 |
| *b15864 | RS29 | 320.42 | N/A | 1962 | Sand to Hard Red Bed | 0.73 | 33 | 0.0221 |
| *b22683 | RS30 | 343.98 | S.H. 99 | 1990 | Silty Sand to Shaley Clay | -1.45 | 13 | -0.1115 |
| *b22686 | RS31 | 378.25 | S.H. 56 | 1990 | Weathered Sandstone to Rock | 3.90 | 15 | 0.2600 |
| *b22666 | RS32 | 378.25 | S.H. 57 | 1990 | Weathered Shale to Rock | 1.66 | 15 | 0.1107 |
| b15870 | RS33 | 382.16 | I-40 | 1962 | Sand to Medium Hard Shale | 17.67 | 38 | 0.4650 |

**Table 3. (Continued)**

| BRI_key | River Station | Miles | Highway | Bridge Installed | Stratum | Max. Scour** (ft) | Duration (yr) | Scour Rate** (ft/yr) |
|---|---|---|---|---|---|---|---|---|
| b15871 | RS34 | 382.16 | I-40 | 1963 | Sand to Gray Shale | -0.42 | 40 | -0.0105 |
| b18361 | RS35 | 385.13 | S.H.48 | 1972 | Sand to Hard Sand Stone | 2.54 | 25 | 0.1018 |
| b10570 | RS36 | 394.03 | S.H. 27 | 1946 | Sand to Shale to Rock | -4.08 | 55 | -0.0742 |
| b21128 | RS37 | 417.02 | U.S. 75 | 1985 | Sand to Coarse Sandy Clay to Gray Shale | 3.95 | 17 | 0.2324 |
| *b14189 | RS38 | 434.44 | S.H. 84 | 1958 | Sand to Shale | 5.00 | 34 | 0.1471 |
| b14200 | RS39 | 434.44 | S.H. 84 | 1958 | Sand to Sand Stone | 15.00 | 47 | 0.3191 |
| b15585 | RS40 | 479.66 | U.S. 69 | 1962 | Rock | 3.50 | 41 | 0.0854 |

* Bridges without cross section data

**Note: (-) Aggradation
: (+) Degradation

**Table 4. Flowline interpolated data for 5 years interval, North Canadian River**

| Location | | | Years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BRI_KEY | River Station | Miles | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 |
| 16523 | RS1 | 15.72 | 1869.33 | 1869.63 | 1869.48 | 1869.43 | 1869.85 | 1870.43 | 1870.43 | 1870.43 | 1870.43 |
| 16642 | RS2 | 15.72 | 1868.13 | 1865.40 | 1865.00 | 1864.40 | 1864.70 | 1864.10 | 1863.87 | 1863.50 | 1862.52 |
| 17509 | RS3 | 29.05 | | 1814.61 | 1813.33 | 1813.29 | 1815.26 | 1815.31 | 1815.31 | 1815.31 | 1815.31 |
| 17602 | RS4 | 29.15 | | 1810.85 | 1811.25 | 1810.38 | 1811.25 | 1809.90 | 1810.00 | 1810.15 | 1810.48 |
| 16193 | RS5 | 62.82 | 1680.06 | 1678.76 | 1679.26 | 1678.16 | 1677.31 | 1676.56 | 1677.30 | 1678.35 | 1676.36 |
| 13679 | RS6 | 97.12 | 1557.18 | 1556.18 | 1554.68 | 1555.51 | 1555.48 | 1556.23 | 1557.88 | 1555.46 | 1559.02 |
| 13655 | RS7 | 97.12 | 1561.40 | 1561.51 | 1561.56 | 1561.61 | 1561.79 | 1561.71 | 1562.00 | 1561.59 | 1561.19 |
| 20864 | RS8 | 125.64 | 1476.40 | 1476.30 | 1475.50 | 1475.37 | 1473.13 | 1471.90 | 1477.40 | 1474.62 | 1471.84 |
| 5523 | RS9 | 125.67 | 1468.50 | 1468.40 | 1467.60 | 1467.47 | 1465.93 | 1468.19 | 1469.17 | 1469.54 | 1469.91 |
| 18134 | RS10 | 129.29 | | | 1460.45 | 1461.53 | 1460.25 | 1460.05 | 1461.25 | 1459.05 | 1456.85 |
| 26237 | RS11 | 185.37 | | | | | | | | 1300.83 | 1295.77 |
| 18608 | RS12 | 185.57 | | | 1302.55 | 1301.97 | 1300.75 | 1300.05 | 1298.23 | 1298.85 | 1302.75 |
| 12832 | RS13 | 202.22 | 1263.00 | 1258.50 | 1260.16 | 1261.82 | 1258.00 | 1257.80 | 1258.05 | 1258.27 | 1258.50 |
| 12820 | RS14 | 202.22 | 1258.15 | 1259.15 | 1255.15 | 1256.82 | 1255.25 | 1254.05 | 1254.75 | 1255.01 | 1254.95 |
| 18352 | RS15 | 202.22 | | | 1253.88 | 1251.88 | 1250.38 | 1249.38 | 1249.49 | 1249.45 | 1250.45 |
| 14208 | RS16 | 209.88 | 1237.75 | 1232.95 | 1232.91 | 1232.87 | 1240.75 | 1230.79 | 1227.3955 | 1231.02 | 1234.65 |

| Table 4. (Continued) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | | | Years | | | | | | | | |
| BRI_KEY | River Station | Miles | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 |
| 16189 | RS17 | 206.03 | 1199.22 | 1207.80 | 1200.50 | 1200.58 | 1198.70 | 1196.70 | 1195.17 | 1191.00 | 1192.50 |
| 16190 | RS18 | 216.04 | 1197.10 | 1207.58 | 1199.68 | 1199.51 | 1198.33 | 1196.08 | 1194.73 | 1193.98 | 1191.68 |
| 27867 | RS 19 | 229.72 | | | | | | | | | 1148.00 |
| 21357 | RS20 | 23275 | | | | | | 1140.45 | 1143.26 | 1142.75 | 1142.25 |
| 21129 | RS21 | 271.65 | | | | | 1042.75 | 1052.60 | 1050.06 | 1051.28 | 1052.50 |
| 05040 | RS22 | 278.83 | 1050.93 | 1052.71 | 1048.64 | 1046.81 | 1045.75 | 1043.44 | 1042.91 | 1037.78 | 1040.51 |
| 20576 | RS 23 | 290.19 | | | | | 1001.25 | 992.68 | 991.35 | 999.05 | 1006.05 |
| 15380 | RS 24 | 292.30 | 1015.59 | 1015.15 | 1015.07 | 1014.61 | 1014.15 | 1013.70 | 1013.24 | 1012.78 | 1012.32 |
| 15381 | RS 25 | 292.31 | 1014.31 | 1014.59 | 1014.51 | 1014.26 | 1014.01 | 1013.76 | 1013.51 | 1013.26 | 1013.01 |
| 15388 | RS 26 | 301.79 | 974.47 | 974.47 | 973.97 | 972.97 | 975.67 | 973.53 | 972.97 | 972.97 | 972.57 |
| 19276 | RS 27 | 308.91 | | | | 955.60 | 955.00 | 954.29 | 953.83 | 953.50 | 953.17 |
| 15865 | RS 28 | 320.10 | 929.62 | 928.62 | 928.07 | 929.27 | 927.27 | 925.97 | 931.17 | 937.30 | 943.42 |
| 15864 | RS 29 | 320.42 | 929.77 | 928.47 | 929.27 | 929.47 | 926.57 | 926.07 | 930.77 | 936.40 | 942.02 |
| 22683 | RS 30 | 343.98 | | | | | | 865.00 | 867.25 | 866.75 | 866.25 |
| 22686 | RS 31 | 378.25 | | | | | | 787.50 | 786.00 | 784.50 | 783.60 |
| 22666 | RS 32 | 378.25 | | | | | | 802.50 | 801.28 | 801.00 | 800.84 |

**Table 4. (Continued)**

| Location | | | Years | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BRI_KEY | River Station | Miles | 1965 | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | 2000 | 2005 |
| 15871 | RS 34 | 382.16 | 777.30 | 777.67 | 776.50 | 777.50 | 777.50 | 775.30 | | | |
| 18361 | RS 35 | 385.13 | | | 764.27 | 762.34 | 762.31 | 762.66 | 777.50 | 777.45 | 777.40 |
| 10570 | RS 36 | 394.03 | 748.74 | 746.38 | 743.74 | 745.99 | 747.54 | 746.84 | 761.46 | 751.46 | 741.46 |
| 21128 | RS 37 | 417.02 | | | | | 685.00 | 680.00 | 741.24 | 746.25 | 748.30 |
| 14189 | RS 38 | 434.44 | 656.40 | 656.52 | 656.60 | 656.55 | 656.50 | 659.00 | 684.17 | 681.94 | 679.70 |
| 14200 | RS 39 | 434.44 | 638.85 | 624.75 | 630.75 | 633.25 | 620.25 | 619.55 | 641.00 | 618.50 | 596.00 |
| 15585 | RS 40 | 479.66 | 527.93 | 527.83 | 527.72 | 527.61 | 527.50 | 522.50 | 620.75 | 614.67 | 628.75 |

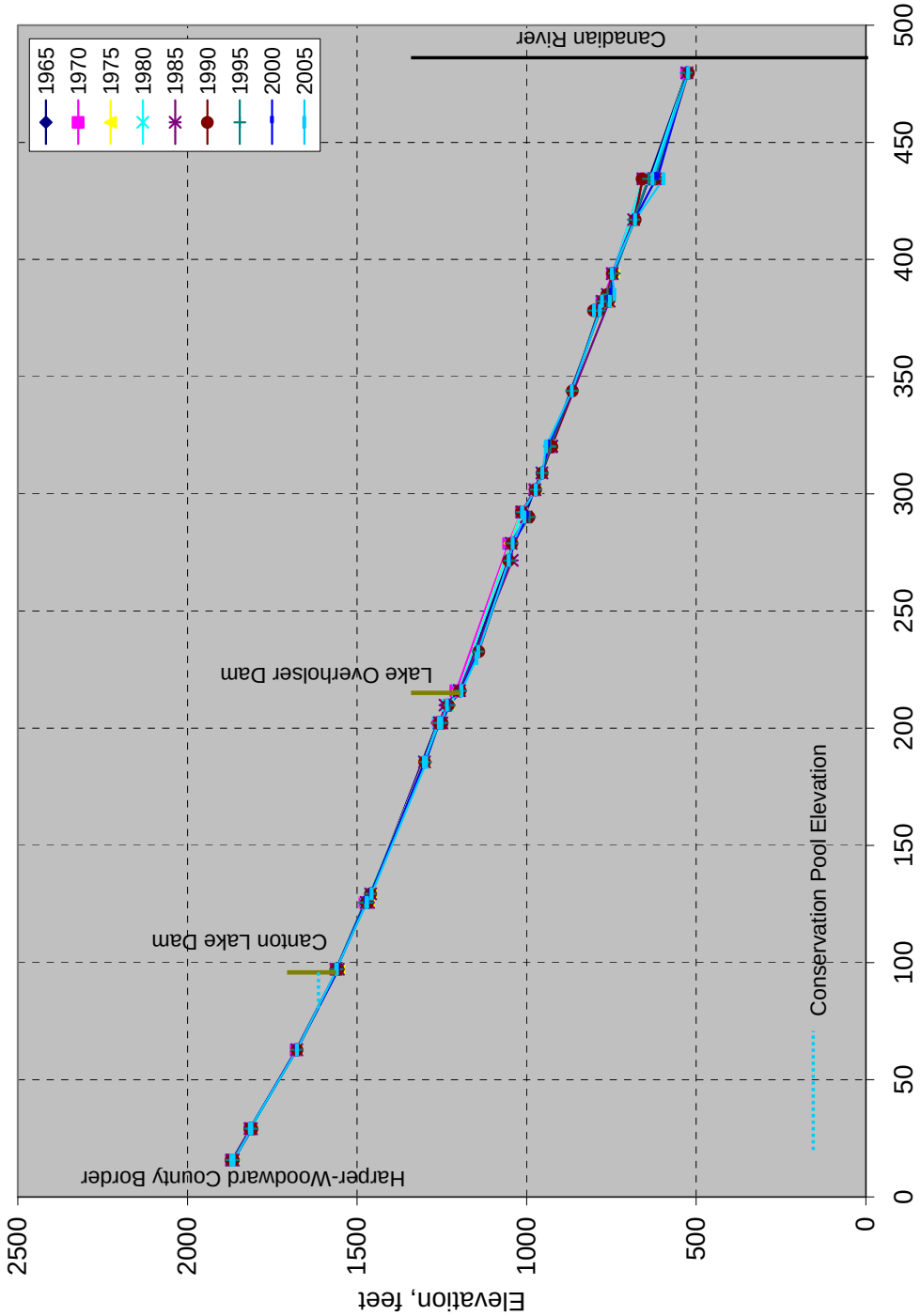



**Figure 41. Longitudinal Profile of North Canadian River Bed, Oklahoma**

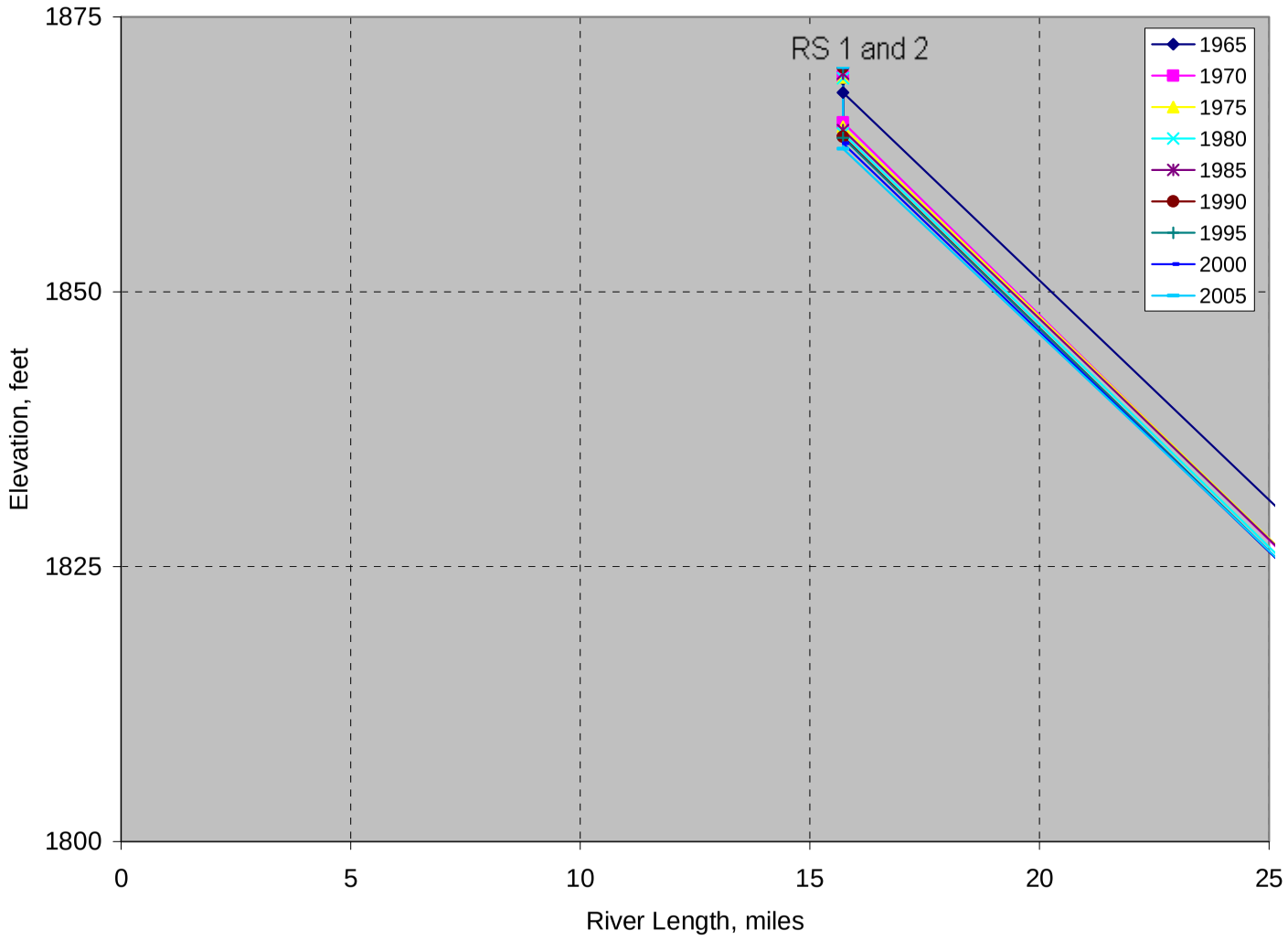



**Figure 42. Longitudinal Profile of North Canadian River Bed, Oklahoma**

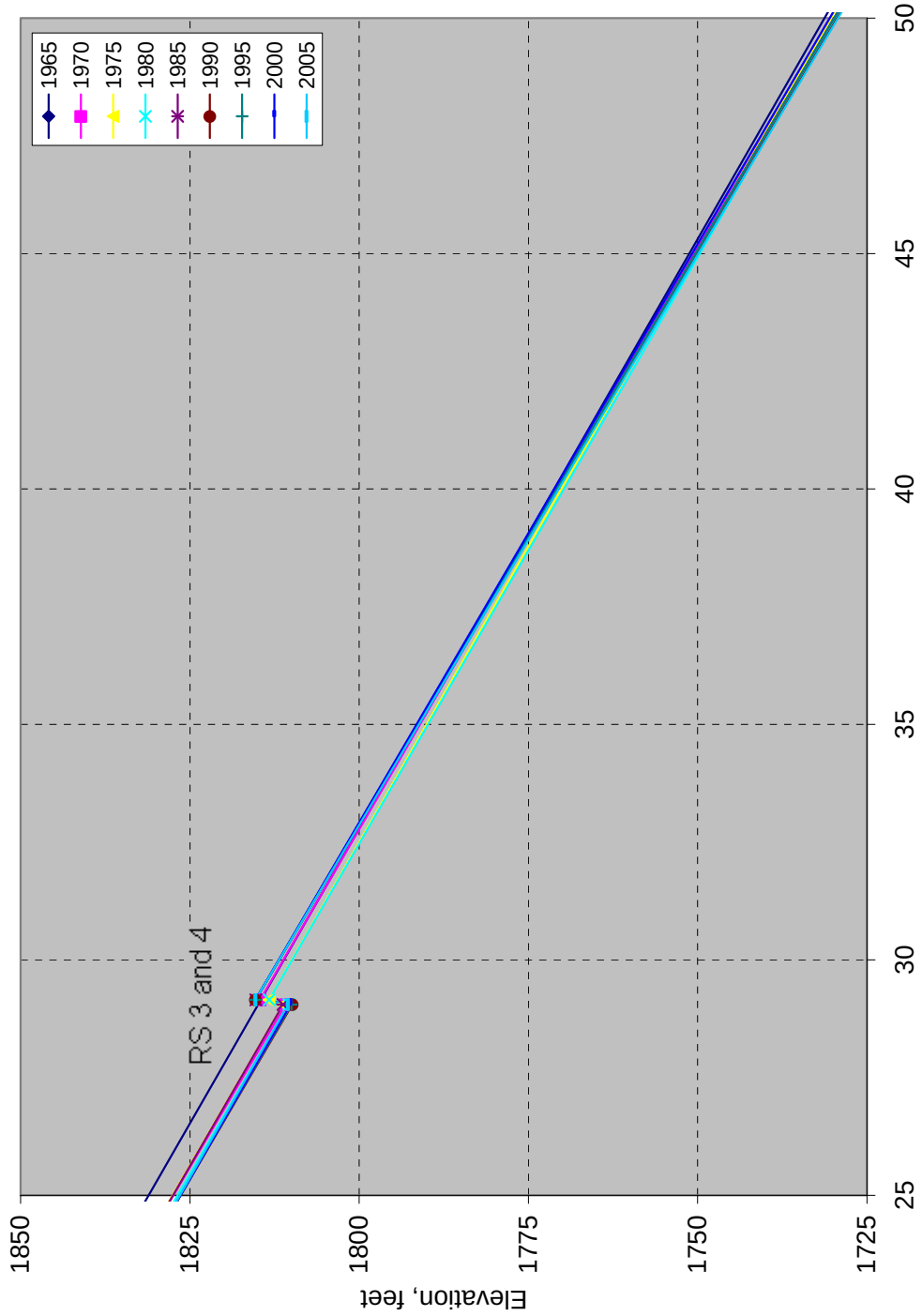



**Figure 43. Longitudinal Profile of North Canadian River Bed, Oklahoma**

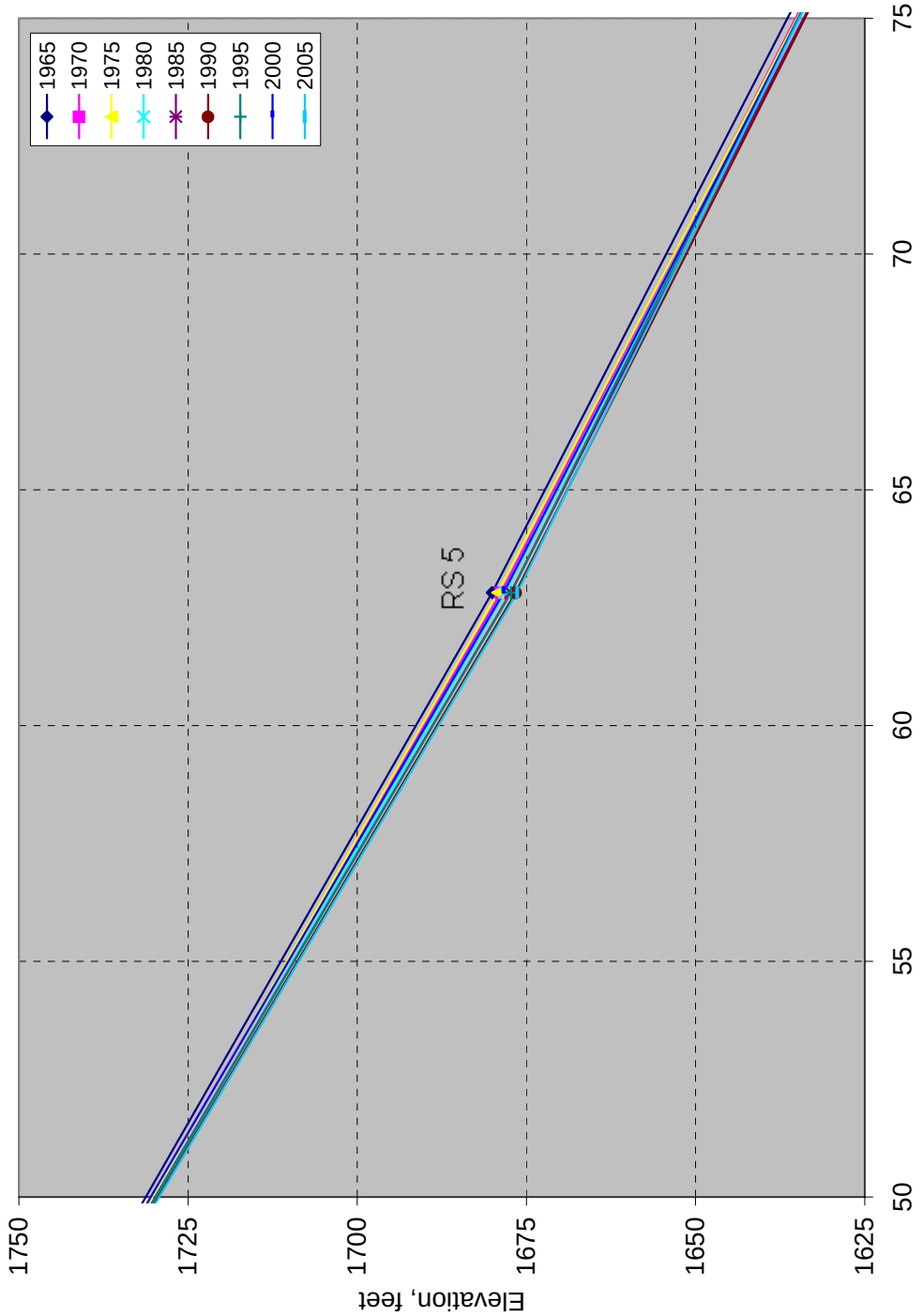



**Figure 44. Longitudinal Profile of North Canadian River Bed, Oklahoma**

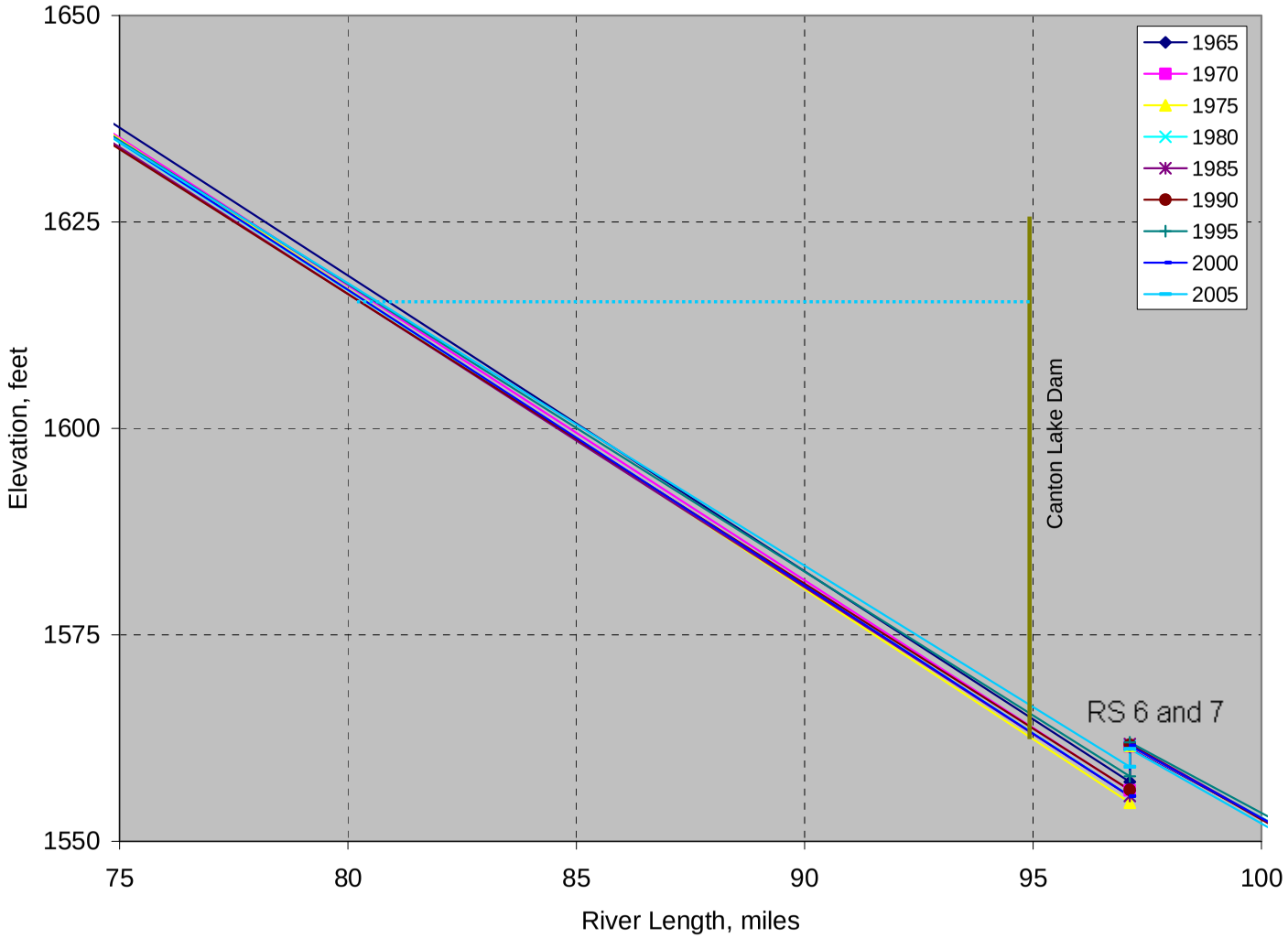



**Figure 45. Longitudinal Profile of North Canadian River Bed, Oklahoma**

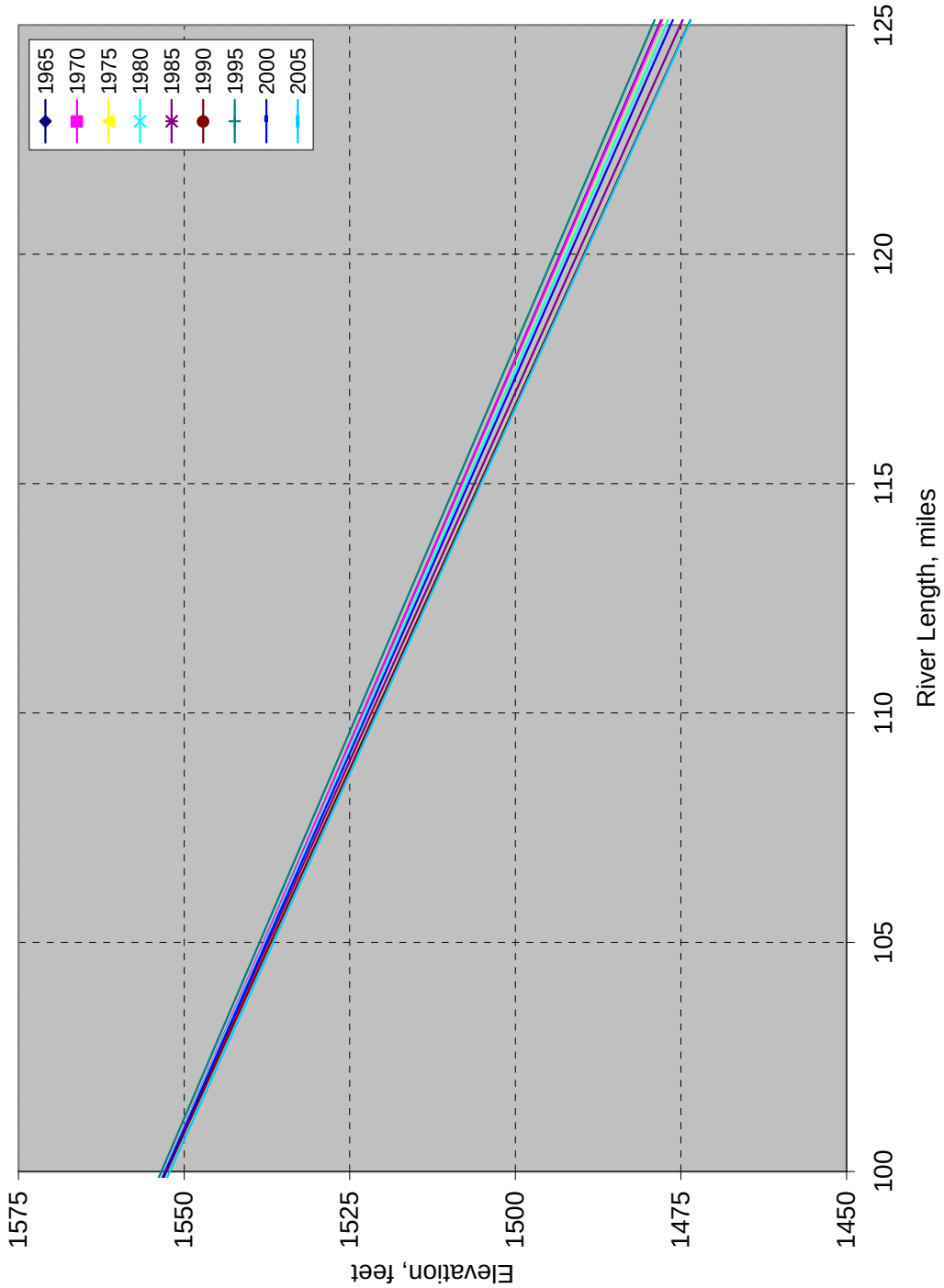



**Figure 46. Longitudinal Profile of North Canadian River Bed, Oklahoma**

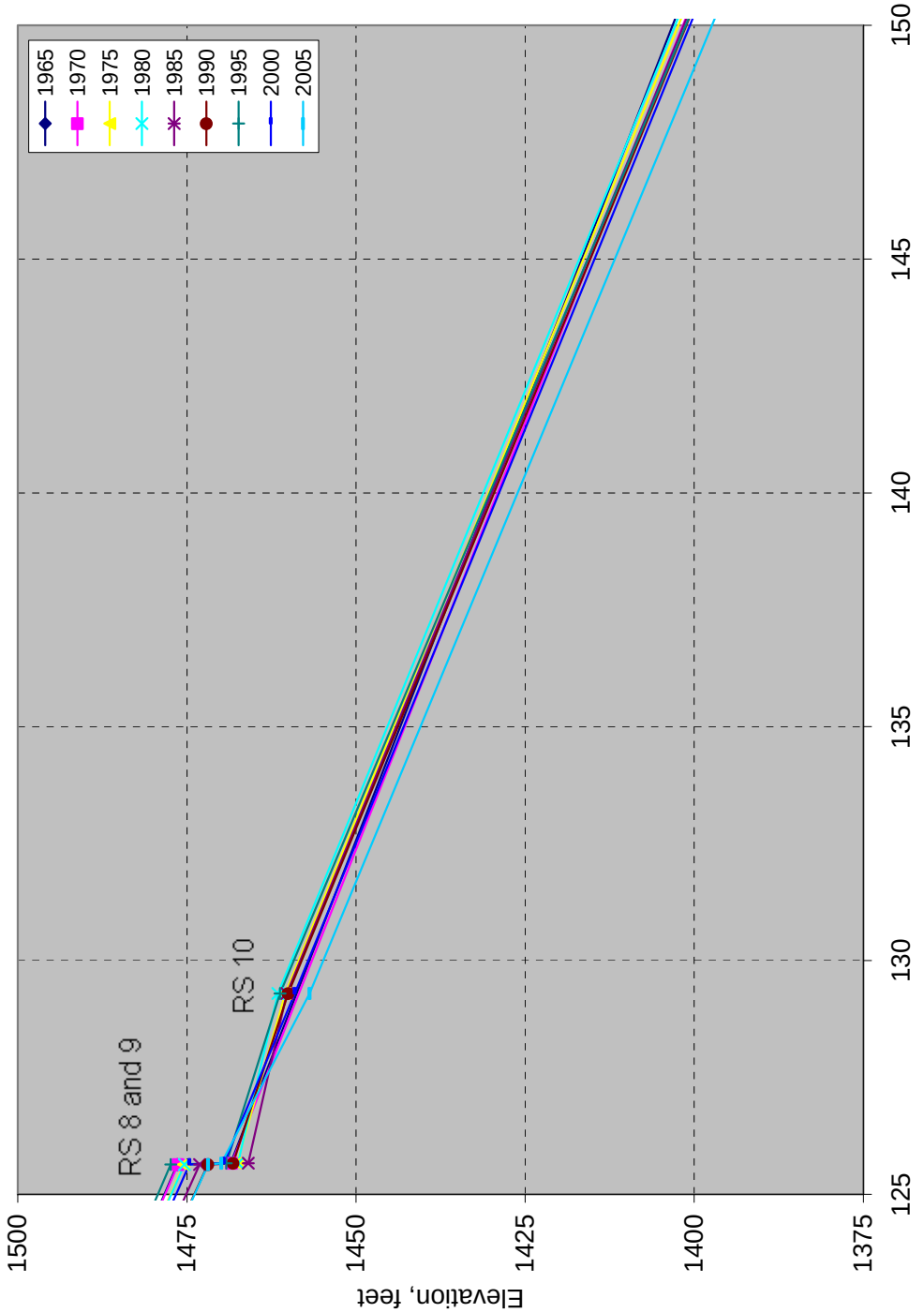



**Figure 47. Longitudinal Profile of North Canadian River Bed, Oklahoma**

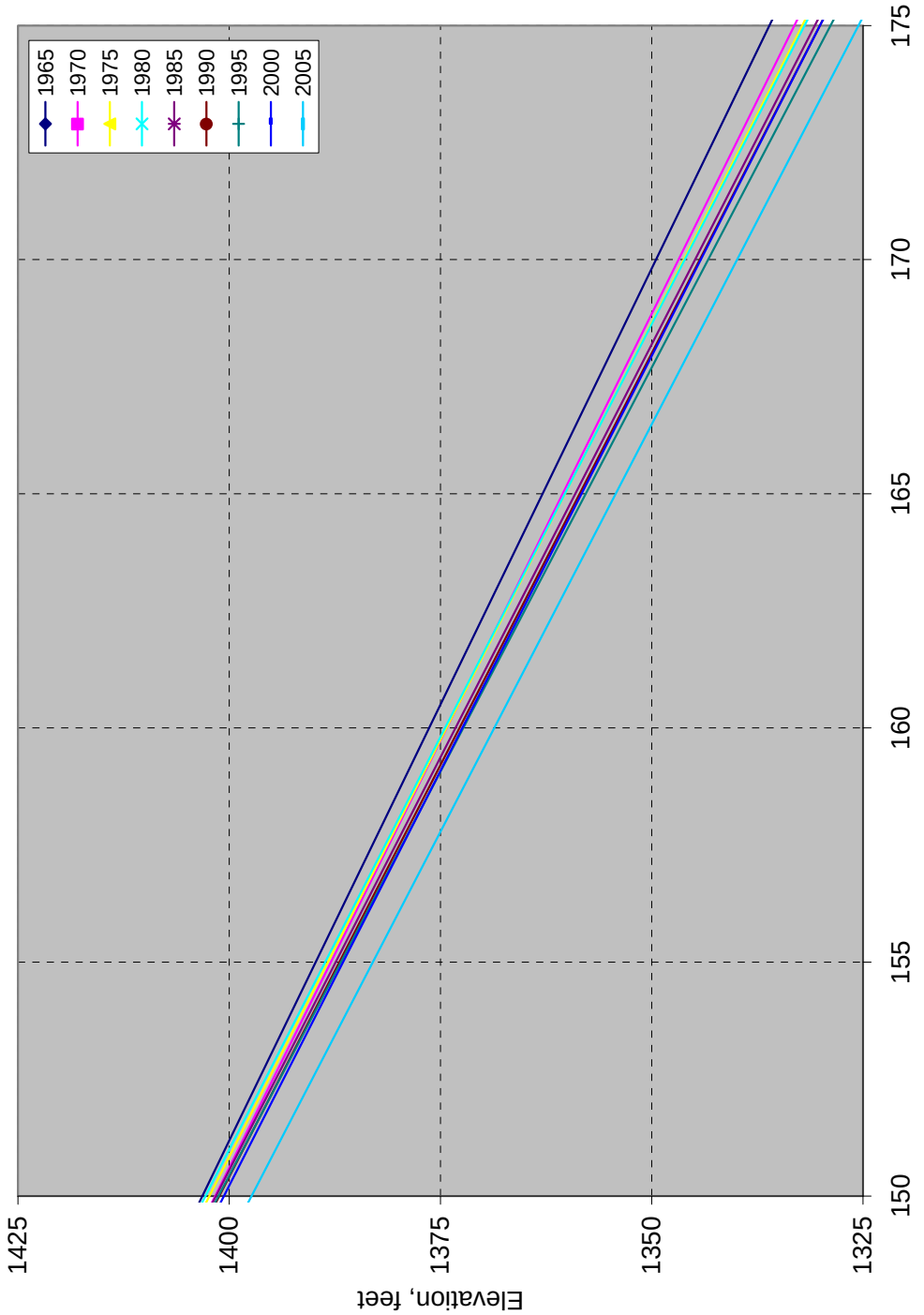



**Figure 48. Longitudinal Profile of North Canadian River Bed, Oklahoma**

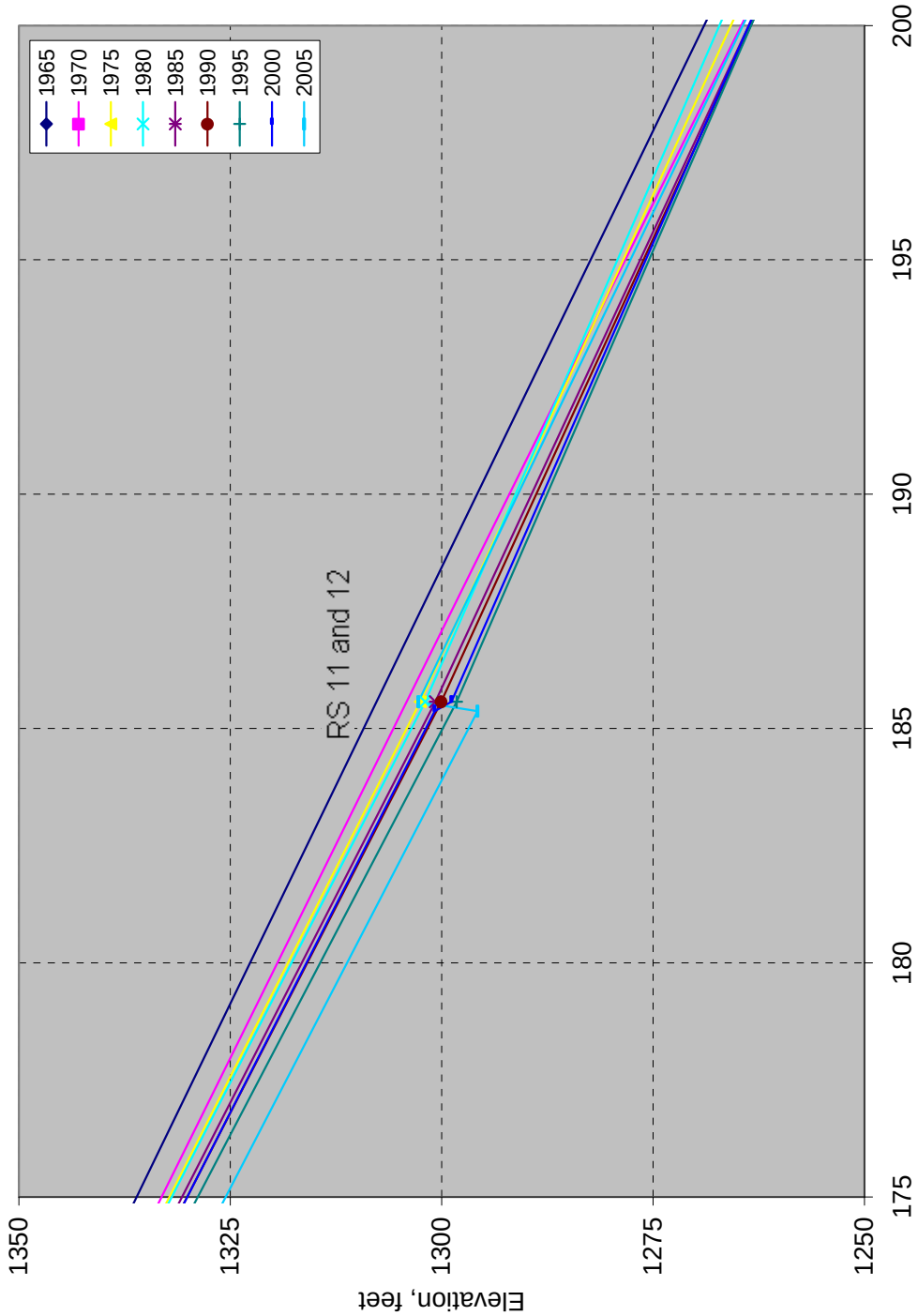



**Figure 49. Longitudinal Profile of North Canadian River Bed, Oklahoma**

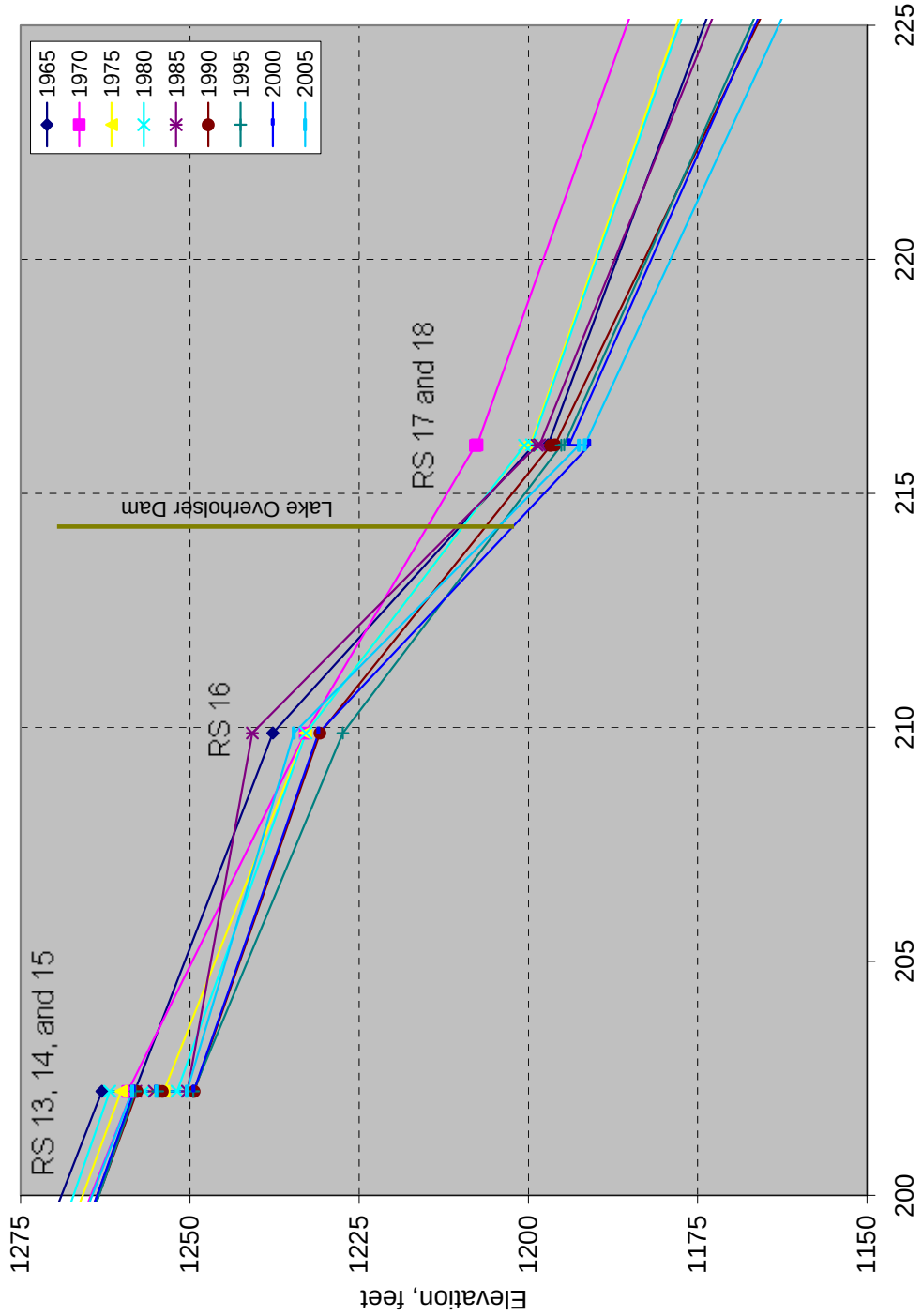



**Figure 50. Longitudinal Profile of North Canadian River Bed, Oklahoma**

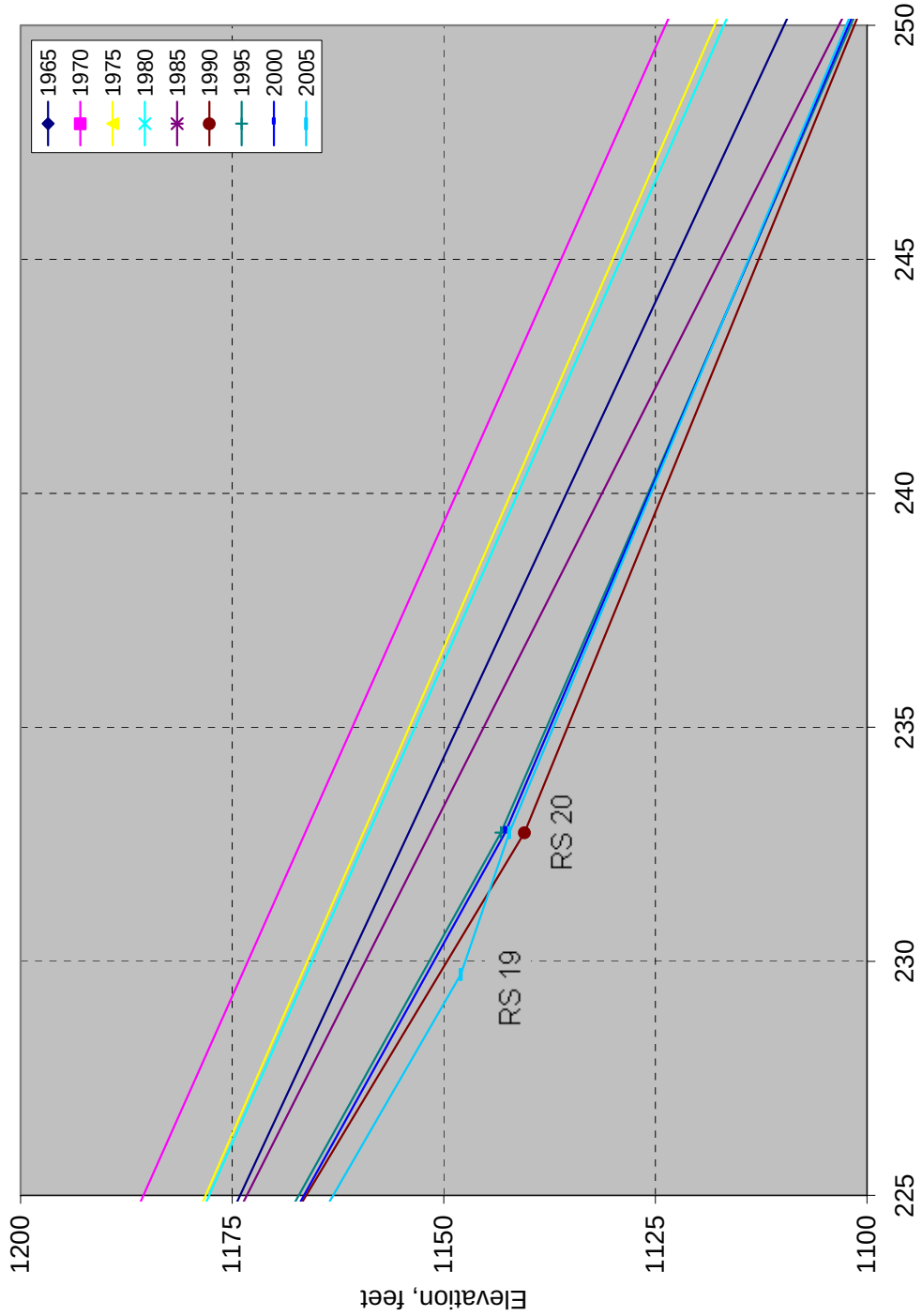



**Figure 51. Longitudinal Profile of North Canadian River Bed, Oklahoma**

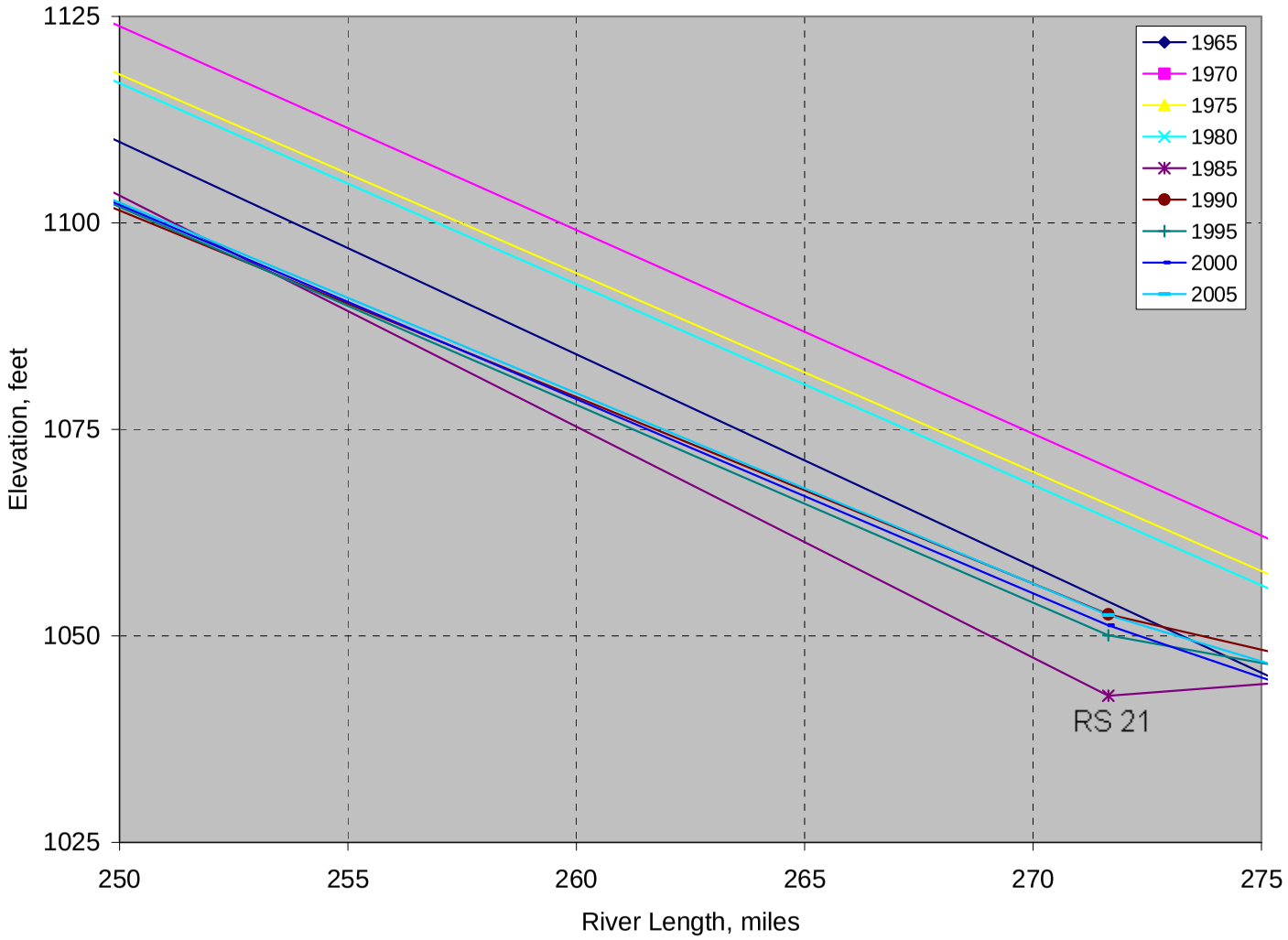



**Figure 52. Longitudinal Profile of North Canadian River Bed, Oklahoma**

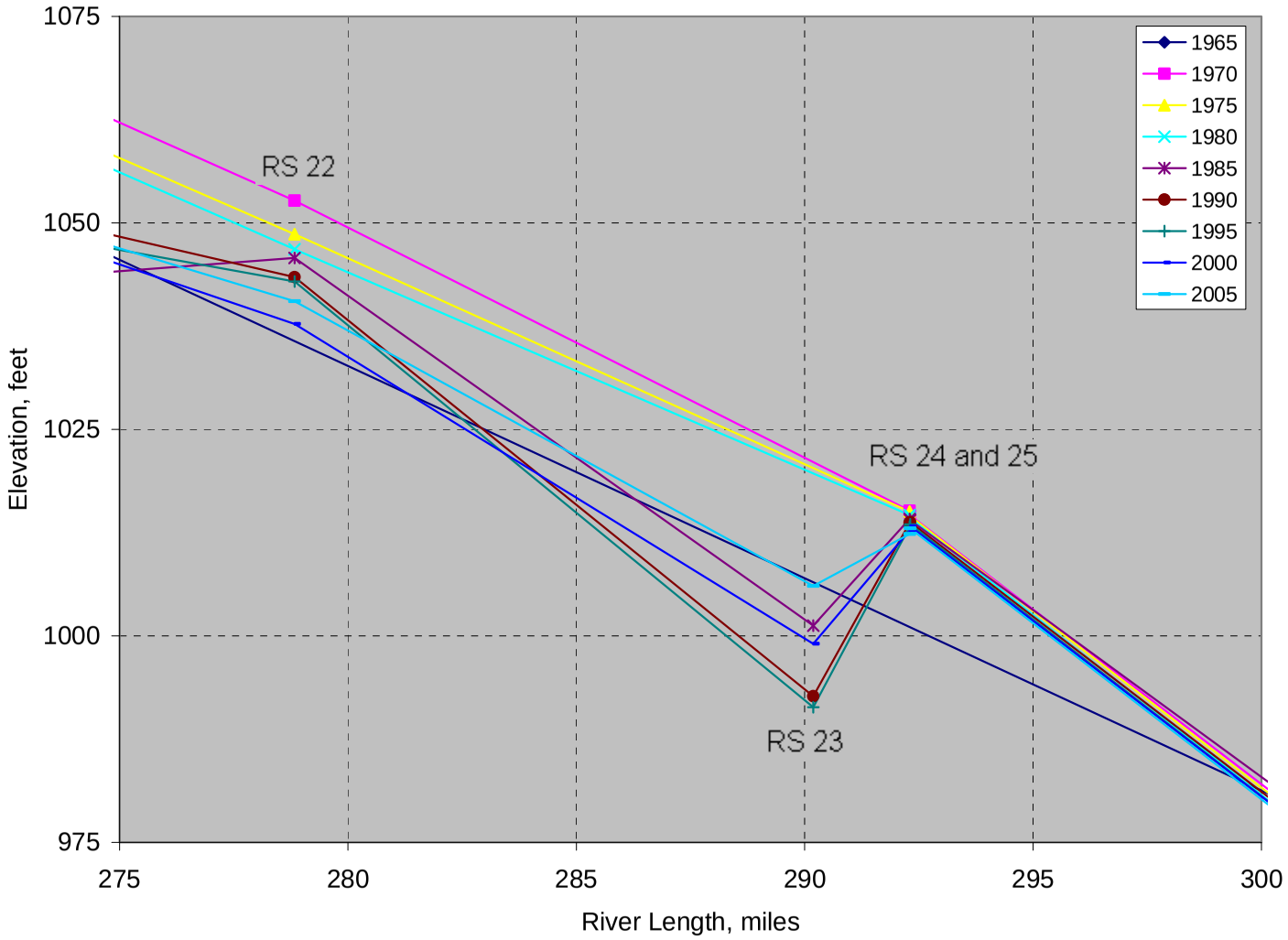



**Figure 53. Longitudinal Profile of North Canadian River Bed, Oklahoma**

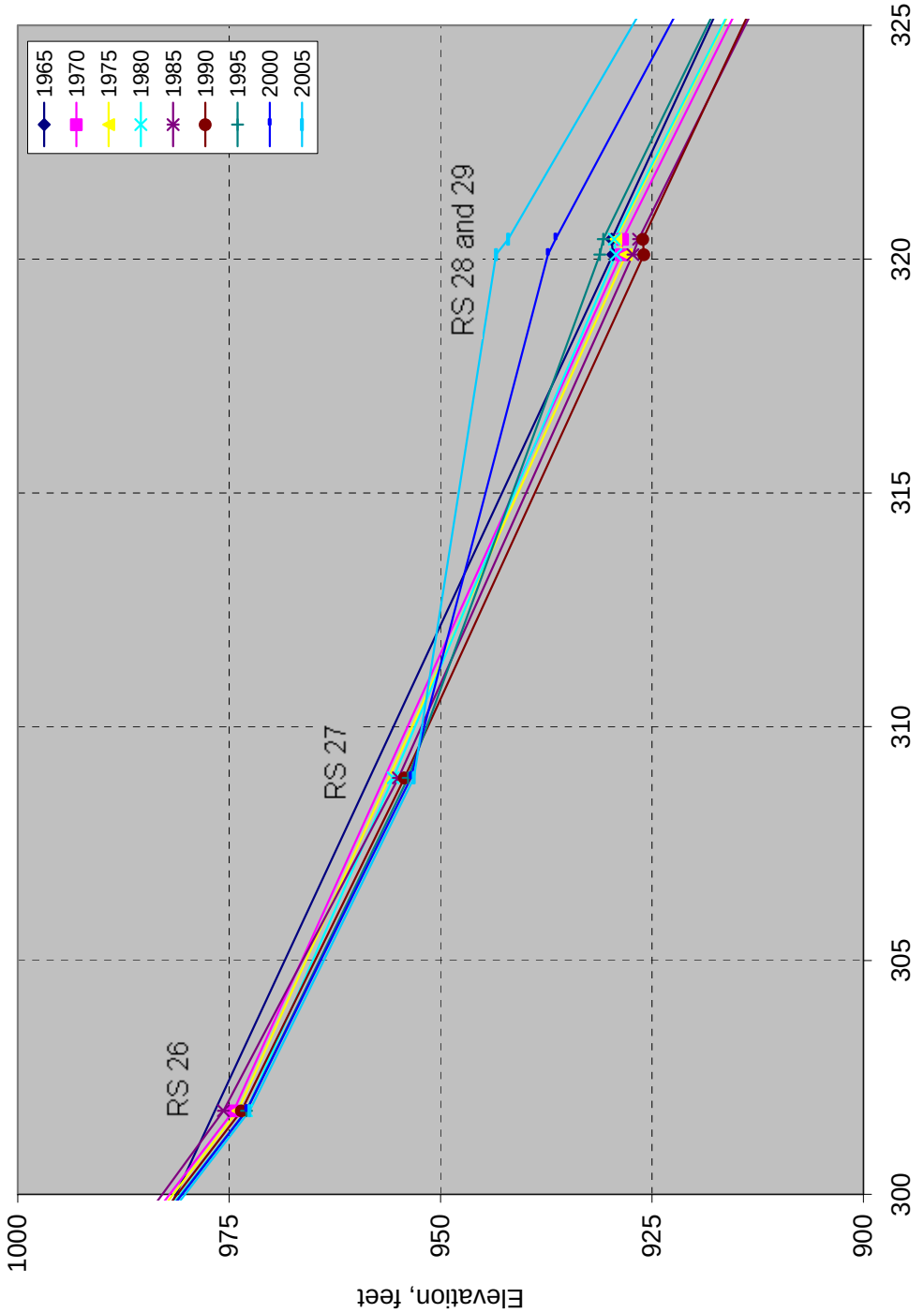



**Figure 54. Longitudinal Profile of North Canadian River Bed, Oklahoma**

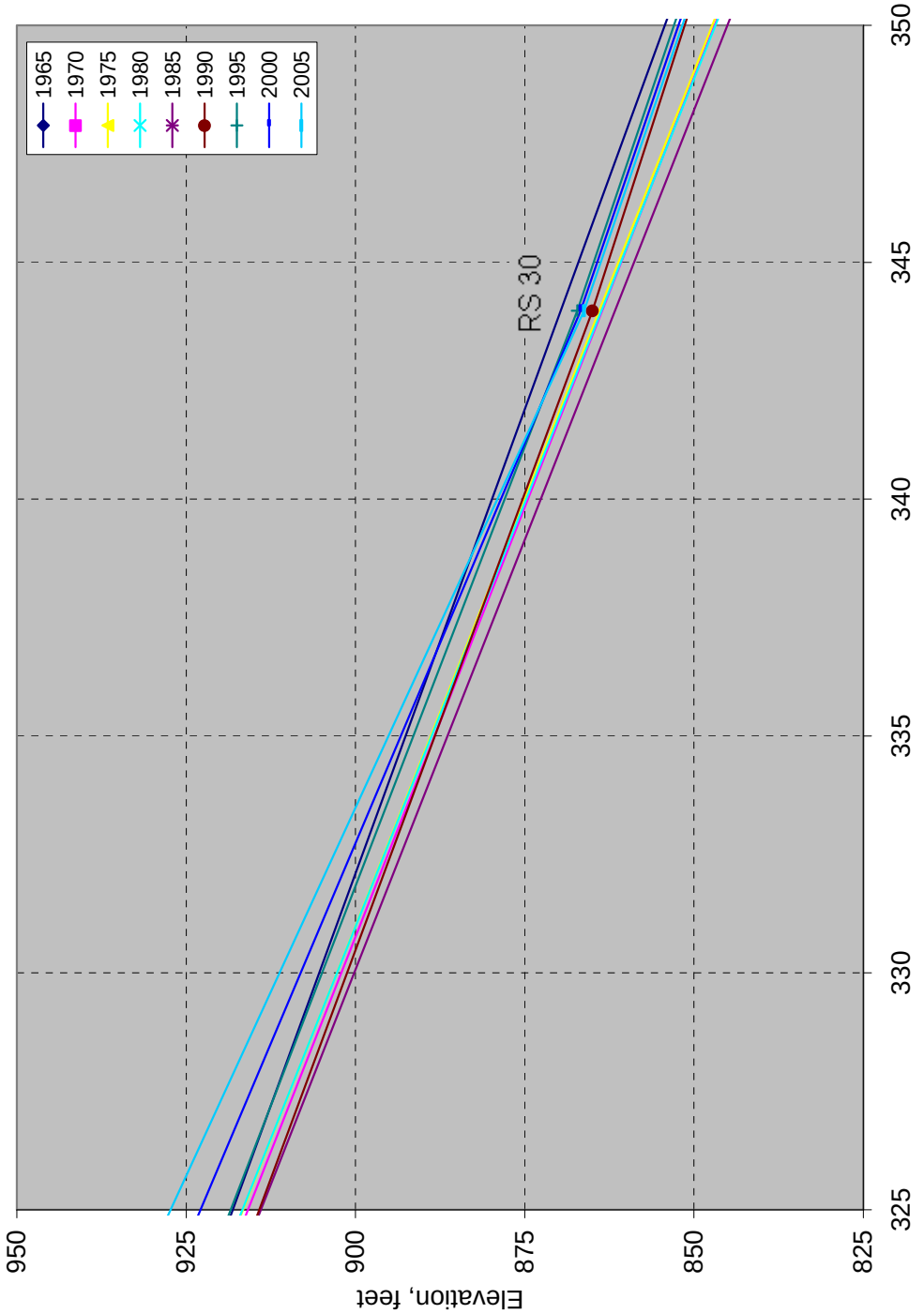



**Figure 55. Longitudinal Profile of North Canadian River Bed, Oklahoma**

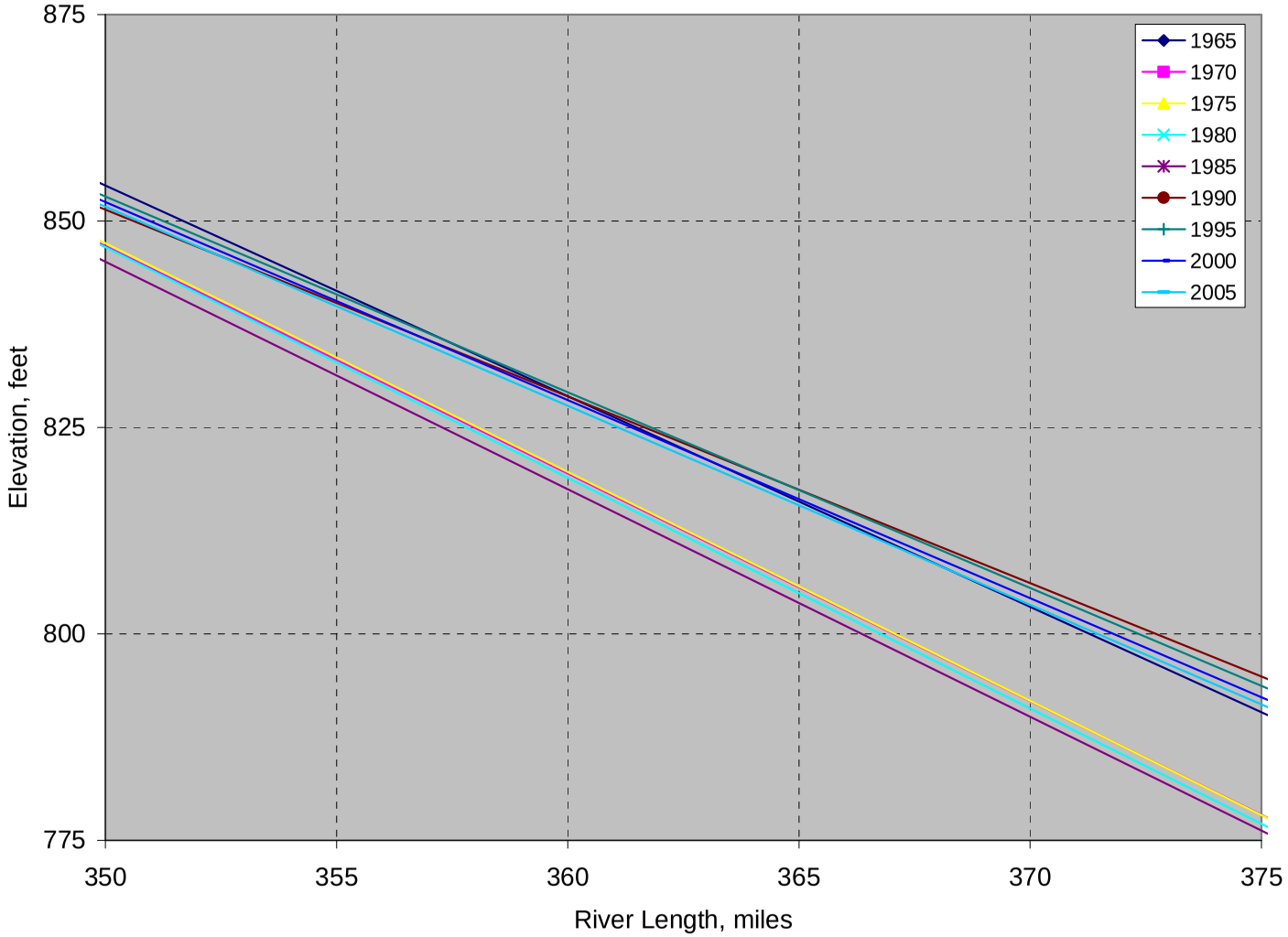



**Figure 56. Longitudinal Profile of North Canadian River Bed, Oklahoma**

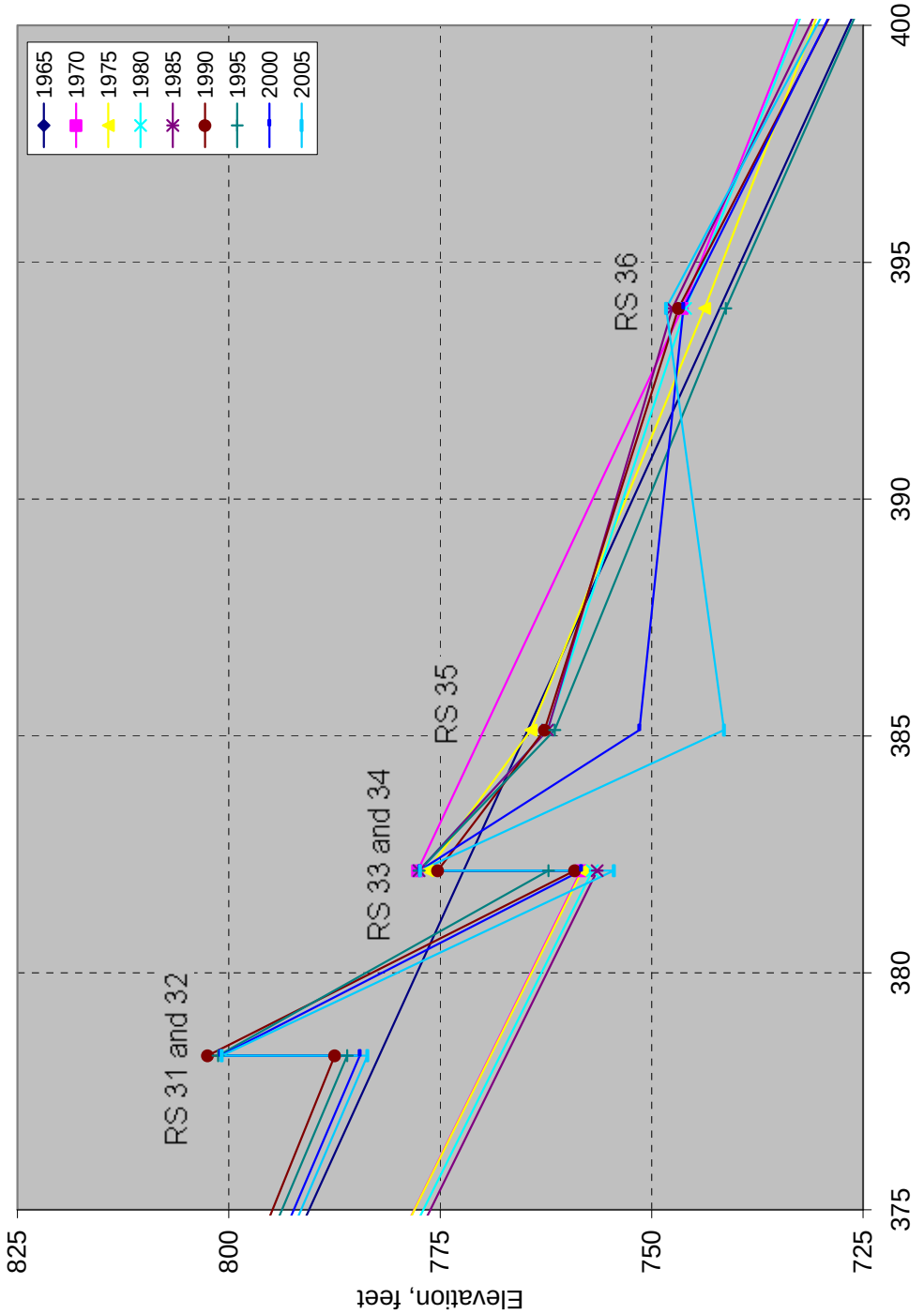



**Figure 57. Longitudinal Profile of North Canadian River Bed, Oklahoma**

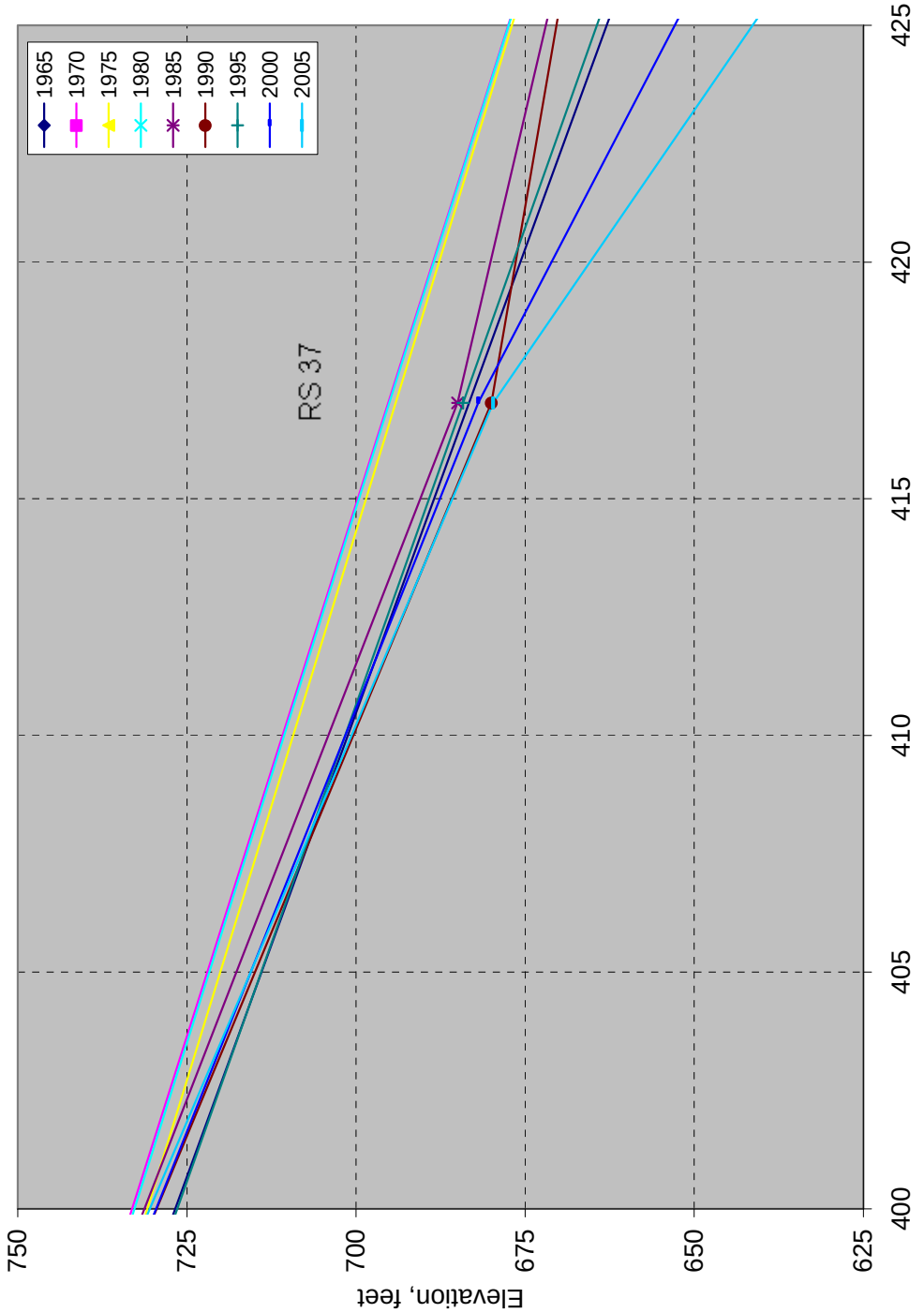



**Figure 58. Longitudinal Profile of North Canadian River Bed, Oklahoma**

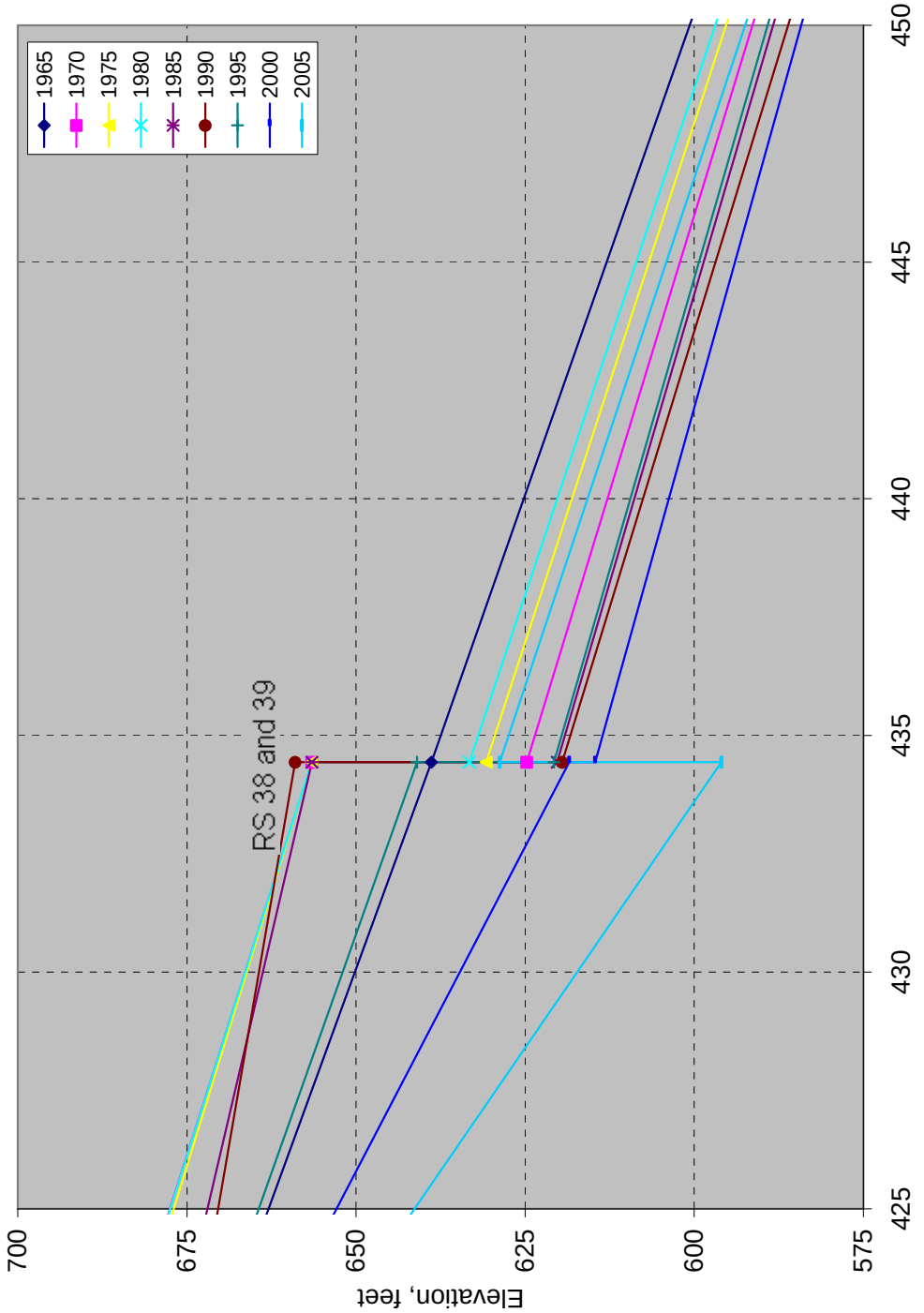



**Figure 59. Longitudinal Profile of North Canadian River Bed, Oklahoma**

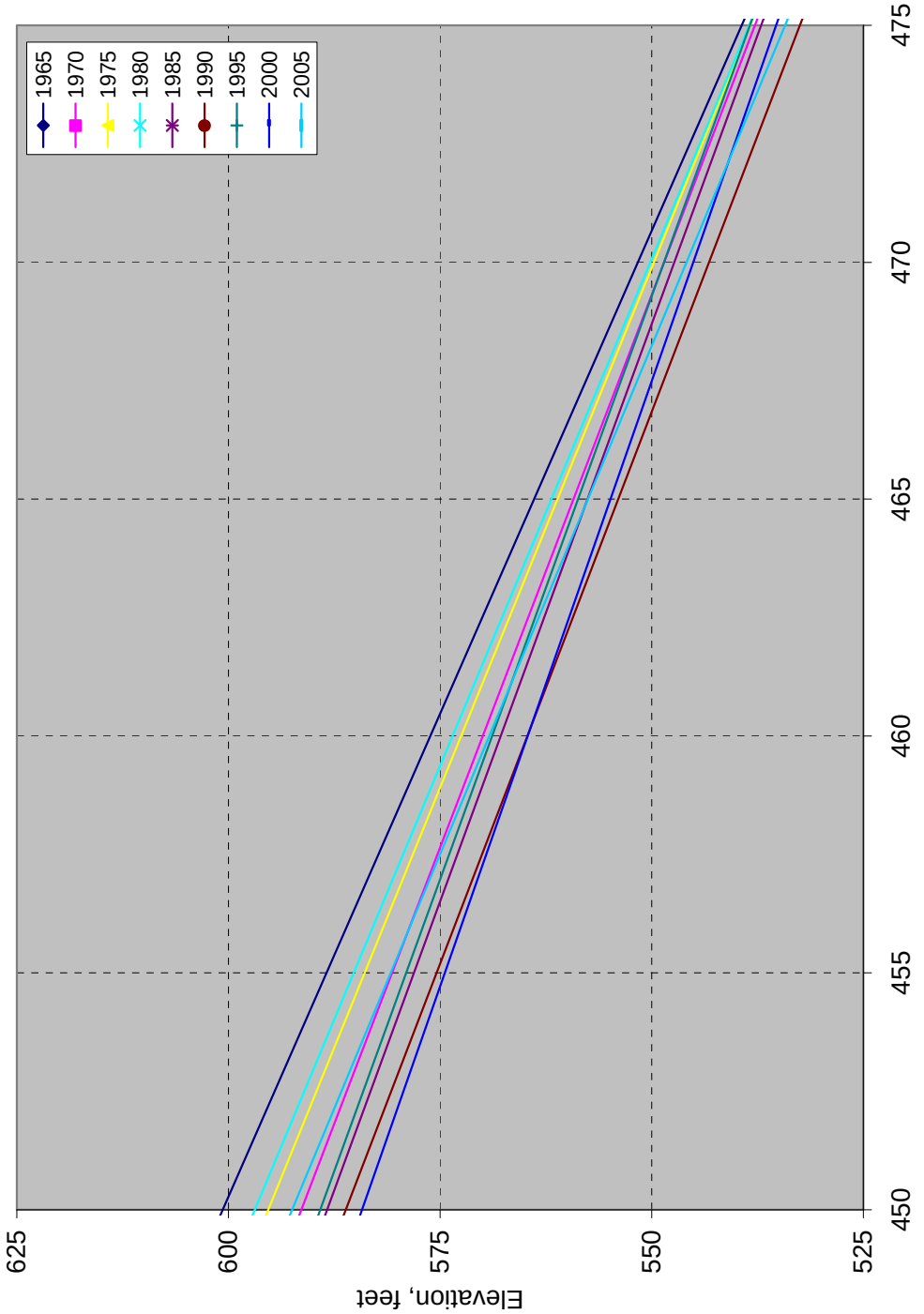



**Figure 60. Longitudinal Profile of North Canadian River Bed, Oklahoma**

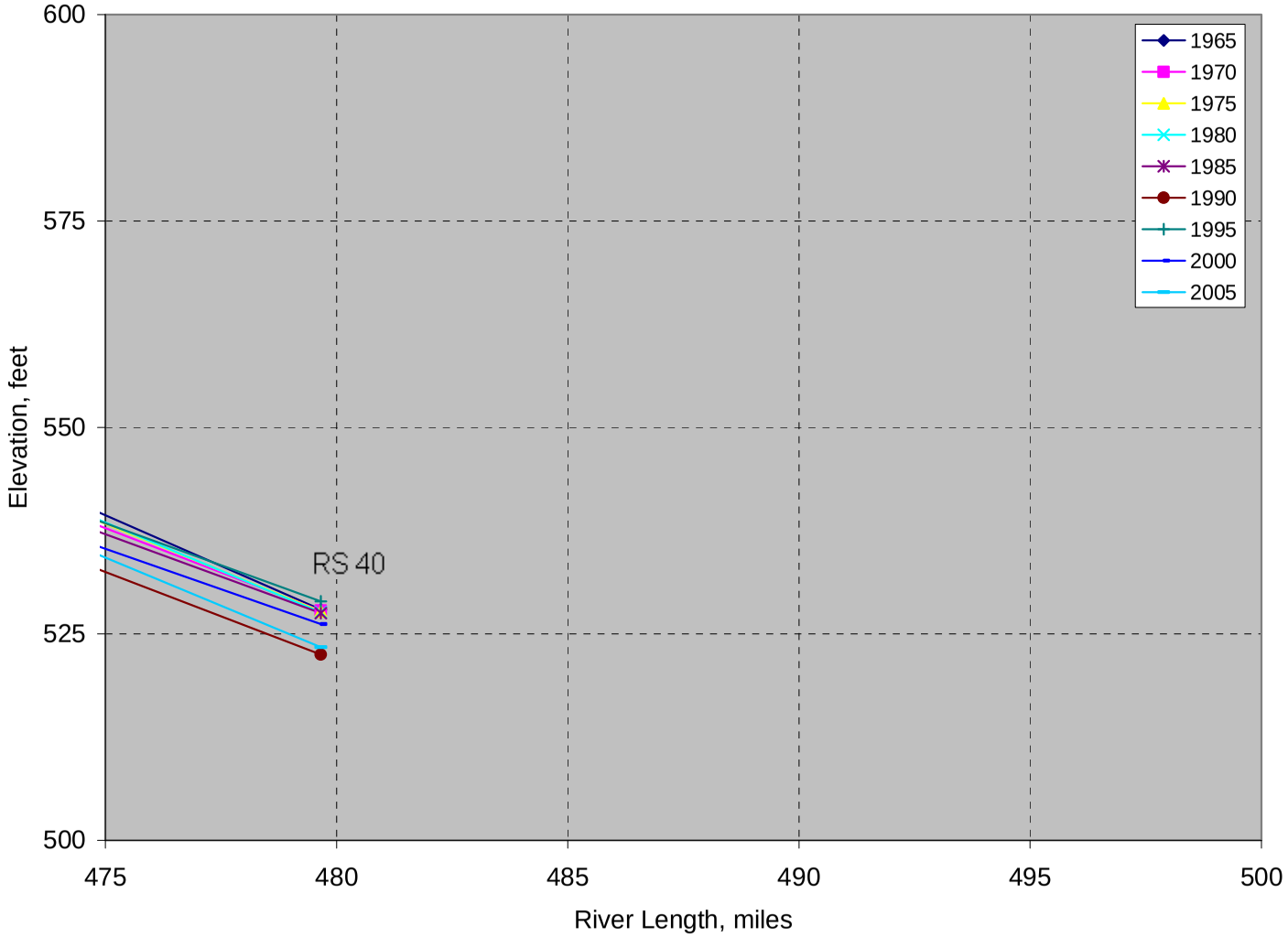



**Figure 61. Longitudinal Profile of North Canadian River Bed, Oklahoma**

## VI. DISCUSSION OF RESULTS

Table 5 presents the summary of bridges which has experienced degradation. Along the 463.85-mile reach of North Canadian River, twenty-five bridges have experienced degradation. Fourteen bridges have experienced degradation in the range of 0-5 feet, two have experienced in the range of 5-10 feet, and three have experienced degradation more then 10 feet. Sixth and seventh columns of Table 5 present the service year of the bridges through 2007 and corresponding degradation in river bed. Nineteen bridges in the study reach of North Canadian have been serving for more than 30 years.

Table 6 presents the number of bridges in the five major river basins of Oklahoma which have experienced degradation more than 5 and 10 feet with 10 year and all service year criteria. In this study, bridges with degradation of 10 feet or more and that have been serving from more then 10 years are determined as critical. River station (RS 23) at S.H. 270, RS 33 at I-40, and RS 39 at S.H. 84 have experienced degradation of 15.6 feet in 11 years, 17.67 feet in 38 yeas, and 15.0 feet in 47 years, respectively. Therefore, RS 23 (Bridge Key b20576), RS 33 (Bridge Key b15870), and RS 39 (Bridge Key b14200) are determined as critical. It is recommended for rehabilitation or replacement. A detailed hydraulic and geotechnical analysis should be performed before reconstruction.

**Table 5. Summary of river bed degradation, North Canadian River**

| Bri_key | River Station | Highway | Miles | Brigde Installed | Years of Construction through 2007 | Max. Scour (ft) | Duration (yr) | Scour Rate (ft/yr) |
|---|---|---|---|---|---|---|---|---|
| b16642 | RS2 | S.H.34 | 15.72 | 1965 | 42 | 4.63 | 35 | 0.1321 |
| b17602 | RS3 | S.H. 50 | 29.05 | 1969 | 38 | 2.78 | 34 | 0.0816 |
| b16193 | RS5 | U.S. 60 | 62.82 | 1964 | 43 | 3.40 | 36 | 0.0944 |
| b20864 | RS8 | U.S. 270 | 125.64 | 1984 | 23 | 1.60 | 20 | 0.0800 |
| b05523 | RS9 | U.S. 270 | 125.67 | 1937 | 70 | 5.83 | 58 | 0.1005 |
| b18134 | RS10 | U.S. 270 | 129.29 | 1971 | 36 | 1.40 | 29 | 0.0483 |
| b26237 | RS11 | U.S. 81 | 185.37 | 2000 | 7 | 5.06 | 5 | 1.0125 |
| b12820 | RS14 | S.H. 4 | 202.22 | 1952 | 55 | 0.80 | 53 | 0.0151 |
| b18352 | RS15 | S.H.4 | 202.22 | 1972 | 35 | 4.55 | 33 | 0.1379 |
| b16189 | RS17 | I-40 | 216.03 | 1964 | 43 | 5.00 | 41 | 0.1220 |
| b16190 | RS18 | I-40 | 216.04 | 1964 | 43 | 3.33 | 41 | 0.0812 |
| b20576 | RS23 | S.H. 270 | 290.19 | 1983 | 24 | 15.60 | 11 | 1.4182 |
| b15380 | RS24 | I-40 | 292.30 | 1961 | 46 | 2.03 | 26 | 0.0781 |
| b15381 | RS25 | I-40 | 292.31 | 1961 | 46 | 0.09 | 26 | 0.0035 |
| b15388 | RS26 | U.S. 270 | 301.79 | 1961 | 46 | 4.43 | 44 | 0.1007 |
| b19276 | RS27 | S.H.-3E | 308.91 | 1976 | 31 | 2.70 | 27 | 0.1000 |
| b15864 | RS29 | N/A | 320.42 | 1962 | 45 | 0.73 | 33 | 0.0221 |
| b22686 | RS31 | S.H. 56 | 378.25 | 1990 | 17 | 3.90 | 15 | 0.2600 |
| b22666 | RS32 | S.H. 57 | 378.25 | 1990 | 17 | 1.66 | 15 | 0.1107 |
| b15870 | RS33 | I-40 | 382.16 | 1962 | 45 | 17.67 | 38 | 0.4650 |
| b18361 | RS35 | S.H.48 | 385.13 | 1972 | 35 | 2.54 | 25 | 0.1018 |
| b21128 | RS37 | U.S. 75 | 417.02 | 1985 | 22 | 3.95 | 17 | 0.2324 |
| b14189 | RS38 | S.H. 84 | 434.44 | 1958 | 49 | 5.00 | 34 | 0.1471 |
| b14200 | RS39 | S.H. 84 | 434.44 | 1958 | 49 | 15.00 | 47 | 0.3191 |
| b15585 | RS40 | U.S. 69 | 479.66 | 1962 | 45 | 3.50 | 41 | 0.0854 |

## Table 6. Summary of bridges with degradation in five river basins

| River Basin | Degradation in ≥10 years | | Degradation with all service year criteria | |
|---|---|---|---|---|
| | ≥ 5.0 feet | ≥ 10.0 feet | ≥ 5.0 feet | ≥ 10.0 feet |
| Arkansas | 5 | 1 | 5 | 1 |
| Cimarron | 6 | 2 | 6 | 2 |
| North Canadian* | 8 | 3 | 9 | 3 |
| Canadian | 7 | 3 | 9 | 5 |
| Washita | 12 | 1 | 12 | 1 |
| Total | 38 | 10 | 41 | 12 |

* This report includes the river basin as indicated. Refer to other volumes **I** through **V** for different river basins.

## VII. CONCLUSIONS AND RECOMMENDATION

Following conclusions can be drawn based on this research:

1) Degradation predominates in Reach 1 from river station (RS)1 to Canton Lake Dam, except some river stations have slight aggradation. Maximum degradation at river station 2 and aggradation at river station 1 both on S.H. 34 in Reach 1 are 4.63 and 1.1 feet, respectively.
2) In Reach 2 from Canton Lake Dam to Lake Overholser Dam, degradation is predominant. Maximum degradation of 5.83 feet is observed in river station 9 on U.S. 270.
3) Bed profile data in Reach 3 from Lake Overholser Dam to river station (RS) 40, shows both aggradation and degradation. The river station 17 downstream of Lake Overholser dam shows the degradation of 5.0 feet in 41 years. In this reach maximum aggradation of 9.75 feet is observed at river station 21 at U.S. 62 and maximum degradation of 17.67 feet is observed at river station 33 at I-40.
4) The North Canadian River in Oklahoma has experienced degradation over 10 feet at three river stations which have been serving more then 10 years. River station (RS 23) at S.H. 270, RS 33 at I-40, and RS 39 at S.H. 84 have experienced degradation of 15.6 feet in 11 years, 17.67 feet in 38 years, and 15.0 feet in 47 years, respectively. These bridges are defined as critical and recommended for rehabilitation or replacement in the replacement cycle. A detailed hydraulic and geotechnical analysis should be performed before reconstruction.

It is recommended that degradation of tributaries is evaluated to determine the structures where flowline is severely degrading in North Canadian River basin.

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# APPENDIX A

## TABLES OF CROSS-SECTIONAL GEOMETRIES,

## NORTH CANADIAN RIVER, OK

**Table 7. Structure, and Flowline Details**
**Bridge No 16523 (RS 1) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b16523 | 1.1 MI N JCT SH 15 | 36-27-06 | 99-23-18 | S.H. 34 | 1965 | 105.90 |

| Year | 1965 | 1969 | 1970 | 1977 | 1982 | 1989 | 1991 |
|---|---|---|---|---|---|---|---|
| **Flowline** | 1869.33 | 1869.43 | 1869.63 | 1869.43 | 1869.43 | 1870.43 | 1870.43 |

**Table 8. Structure, Cross-section, and Flowline Details**
**Bridge No 16642 (RS 2) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b16642 | 8 MI N JCT SH 15 | 36-26-48 | 99-23-18 | S.H.34 | 1965 | 1,105.00 |

| Pier_No | Distance | Pier_BTM | Pier_Top | R-bed 65 | S-Rding92 | R-bed92 | S-Rding00 | R-bed00 |
|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 1860.00 | 1882.00 | 1878.25 | 10.00 | 1879.10 | 10.10 | 1879.00 |
| 1 | 102.00 | 1854.47 | 1882.47 | 1868.75 | 20.00 | 1869.10 | 20.30 | 1868.80 |
| | 152.00 | | | 1868.13 | | | 20.80 | 1868.30 |
| | 182.00 | | | 1868.13 | 25.00 | 1864.10 | | |
| 2 | 202.00 | 1854.98 | 1882.98 | 1868.13 | 23.50 | 1865.60 | 24.40 | 1864.70 |
| | 222.00 | | | 1868.13 | 25.30 | 1863.80 | | |
| | 252.00 | | | 1868.13 | | | 25.60 | 1863.50 |
| 3 | 302.00 | 1854.93 | 1882.93 | 1868.13 | 20.80 | 1868.30 | 20.90 | 1868.20 |
| | 362.00 | | | 1872.50 | 19.00 | 1870.10 | | |
| 4 | 402.75 | 1855.21 | 1883.21 | 1872.50 | 20.20 | 1868.90 | 20.20 | 1868.90 |
| | 452.75 | | | 1872.50 | | | 19.30 | 1869.80 |
| 5 | 503.50 | 1855.17 | 1883.17 | 1872.50 | 19.80 | 1869.30 | 20.40 | 1868.70 |
| | 553.50 | | | 1872.50 | | | 19.10 | 1870.00 |
| 6 | 603.50 | 1855.45 | 1883.46 | 1873.13 | 20.30 | 1868.80 | 20.50 | 1868.60 |
| 7 | 703.50 | 1855.19 | 1883.19 | 1872.50 | 19.80 | 1869.30 | 19.90 | 1869.20 |
| 8 | 804.25 | 1855.26 | 1883.26 | 1871.88 | 19.60 | 1869.50 | 19.80 | 1869.30 |
| 9 | 905.00 | 1855.00 | 1883.00 | 1870.63 | 19.60 | 1869.50 | 20.00 | 1869.10 |
| 10 | 1005.00 | 1855.07 | 1883.07 | 1871.75 | 17.80 | 1871.30 | 18.30 | 1870.80 |
| N-A | 1107.00 | 1860.00 | 1882.00 | 1873.75 | 9.70 | 1879.40 | 10.30 | 1878.80 |

| Year | 1965 | 1967 | 1969 | 1970 | 1971 | 1973 | 1974 | 1979 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1866.1 | 1866.1 | 1866.1 | 1865.4 | 1865.1 | 1865.2 | 1865.10 | 1864.60 |

| Year | 1982 | 1985 | 1987 | 1989 | 1990 | 1992 |
|---|---|---|---|---|---|---|
| Flowline | 1864 | 1864.70 | 1864.1 | 1864.1 | 1864.1 | 1864.1 |

**Table 9. Structure, and Flowline Details**
**Bridge No 17509 (RS 3) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b17509 | 5.3 MI N JCT US 183 | 36-23-18 | 99-13-42 | S.H. 50 | 1969 | 160.10 |

| Year | 1970 | 1977 | 1982 | 1989 | 1991 |
|---|---|---|---|---|---|
| Flowline | 1814.61 | 1812.81 | 1815.21 | 1815.31 | 1815.31 |

**Table 10. Structure, Cross-section, and Flowline Details**
**Bridge No 17602 (RS 4)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b17602 | 5.4 MI N JCT US 183 | 36-23-18 | 99-13-42 | S.H. 50 | 1969 | 801.50 |

| PIER_NO | DISTANCE | PIER_BTM | PIER_TOP | R_BED 69 | S_RDING 92 | R_BED 92 | S_RDING 93 | R_BED 93 |
|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 1780.00 | 1827.09 | 1825.00 | | | | |
| 1 | 100.00 | 1802.56 | 1827.56 | 1820.00 | | | | |
| 2 | 200.00 | 1803.24 | 1828.84 | 1817.50 | | | | |
| 3 | 300.00 | 1803.25 | 1828.25 | 1813.13 | 21.60 | 1814.65 | 21.60 | 1814.65 |
| | 310.00 | | | 1813.13 | | | | |
| | 328.00 | | | 1813.13 | | | | |
| | 334.00 | | | 1813.13 | | | | |
| | 340.00 | | | 1813.13 | | | | |
| | 344.00 | | | 1813.13 | | | | |
| | 346.00 | | | 1813.13 | 21.70 | 1814.55 | | |
| | 348.00 | | | 1813.13 | | | 21.30 | 1814.95 |
| | 350.00 | | | 1813.13 | | | | |
| | 351.00 | | | 1813.13 | | | | |
| | 363.00 | | | 1813.13 | 25.10 | 1811.15 | | |
| | 365.00 | | | 1813.13 | | | | |
| | 375.00 | | | 1813.13 | | | | |
| | 377.00 | | | 1813.13 | | | | |
| | 380.00 | | | 1813.13 | 25.70 | 1810.55 | | |
| | 387.00 | | | 1813.13 | | | | |
| | 390.00 | | | 1813.13 | | | 26.00 | 1810.25 |
| 4 | 400.75 | 1803.48 | 1828.42 | 1813.13 | 25.50 | 1810.75 | 25.70 | 1810.55 |

**Table 10. (Continued)**

| PIER_NO | DISTANCE | PIER_BTM | PIER_TOP | R_BED 69 | S_RDING 92 | R_BED 92 | S_RDING 93 | R_BED 93 |
|---|---|---|---|---|---|---|---|---|
| | 407.75 | | | 1813.13 | | | | |
| | 410.75 | | | 1813.13 | 24.40 | 1811.85 | | |
| | 419.75 | | | 1813.13 | | | | |
| | 423.75 | | | 1813.13 | | | | |
| | 427.75 | | | 1813.13 | | | | |
| | 430.75 | | | 1815.00 | | | | |
| | 437.75 | | | 1815.00 | | | | |
| | 441.75 | | | 1815.00 | | | 19.90 | 1816.35 |
| | 444.75 | | | 1815.00 | 19.40 | 1816.85 | | |
| | 447.75 | | | 1815.00 | | | | |
| | 450.75 | | | 1815.00 | | | | |
| | 460.75 | | | 1815.00 | | | | |
| | 490.75 | | | 1816.25 | | | | |
| 5 | 501.50 | 1803.25 | 1828.25 | 1816.25 | | | 20.70 | 1815.55 |
| 6 | 601.50 | 1803.24 | 1828.24 | 1818.25 | | | | |
| 7 | 701.50 | 1802.56 | 1827.55 | 1818.25 | | | | |
| N-A | 801.50 | 1780.00 | 1827.09 | 1825.00 | | | | |

**Table 10. (Continued)**

| S_RDING 93 | R_BED 93 | S_RDING 94 | R_BED 94 | S_RDING 96 | R_BED 96 | S_RDING 97 | R_BED 97 |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 21.60 | 1814.65 | 21.70 | 1814.55 | 21.60 | 1814.65 | 21.50 | 1814.75 |
| | | | | 22.00 | 1814.25 | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | 20.30 | 1815.95 |
| | | | | 20.70 | 1815.55 | | |
| | | | | | | | |
| 20.90 | 1815.35 | | | | | | |
| | | 21.70 | 1814.55 | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | 25.00 | 1811.25 | | |
| | | | | | | | |
| | | 25.70 | 1810.55 | | | | |
| | | | | | | | |
| | | | | | | | |
| 25.90 | 1810.35 | | | | | | |
| 25.60 | 1810.65 | 25.30 | 1810.95 | 26.80 | 1809.45 | 26.80 | 1809.45 |

**Table 10. (Continued)**

| S_RDING 93 | R_BED 93 | S_RDING 94 | R_BED 94 | S_RDING 96 | R_BED 96 | S_RDING 97 | R_BED 97 |
|---|---|---|---|---|---|---|---|
| | | | | | | 20.70 | 1815.55 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | 23.80 | 1812.45 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | 19.80 | 1816.45 |
| | | | | | | | |
| | | | | 20.00 | 1816.25 | | |
| | | | | | | | |
| 19.80 | 1816.45 | 20.00 | 1816.25 | | | | |
| | | | | | | 20.60 | 1815.65 |
| | | | | | | | |
| 20.80 | 1815.45 | 20.80 | 1815.45 | 20.80 | 1815.45 | 20.90 | 1815.35 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**Table 10. (Continued)**

| S_RDING 99 | R_BED 99 | S_RDING 00 | R_BED 00 | S_RDING 03 | R_BED 03 |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| 20.40 | 1815.85 | 20.70 | 1815.55 | 20.80 | 1815.45 |
| | | | | | |
| | | | | 21.10 | 1815.15 |
| | | 21.3 | 1814.95 | | |
| | | | | 20.70 | 1815.55 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | 25.90 | 1810.35 |
| | | | | | |
| | | | | | |
| | | 26.1 | 1810.15 | | |
| | | | | | |
| | | | | | |
| 26.20 | 1810.05 | | | | |
| | | | | 25.40 | 1810.85 |
| 25.50 | 1810.75 | 25.80 | 1810.45 | 24.90 | 1811.35 |

**Table 10. (Continued)**

| S_RDING 99 | R_BED 99 | S_RDING 00 | R_BED 00 | S_RDING 03 | R_BED 03 |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| 22.40 | 1813.85 | | | | |
| | | | | | |
| | | | | 22.70 | 1813.55 |
| 23.20 | 1813.05 | | | | |
| | | | | | |
| 19.90 | 1816.35 | 20.10 | 1816.15 | | |
| | | | | | |
| | | | | 19.90 | 1816.35 |
| | | | | | |
| | | | | | |
| | | | | 21.00 | 1815.25 |
| 21.10 | 1815.15 | 21.60 | 1814.65 | 20.90 | 1815.35 |
| | | | | | |
| | | | | | |
| | | | | | |

**Table 10. (Continued)**

| Year | 1970 | 1971 | 1973 | 1974 | 1977 | 1979 | 1982 |
|---|---|---|---|---|---|---|---|
| Flowline | 1810.85 | 1811.25 | 1811.25 | 1811.25 | 1811.25 | 1810.35 | 1810.45 |

| Year | 1985 | 1987 | 1989 | 1991 | 1992 | 1993 |
|---|---|---|---|---|---|---|
| Flowline | 1811.25 | 1811.25 | 1810.25 | 1809.55 | 1810.55 | 1809.35 |

**Table 11. Structure, Cross-section, and Flowline Details**
**Bridge No 16193 (RS 5) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b16193 | 1.5 MI. N. Dewey C/L | 36-11-00 | 98-55-12 | U.S. 60 | 1964 | 924.00 |

| Pier-No | Distance | Pier-BTM | Pier-Top | R-bed64 | S-Rding92 | R-bed92 | S-Rding98 | R-bed98 | S-Rding00 | R-bed00 |
|---|---|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 1670.00 | 1696.91 | 1690.00 | 9.50 | 1694.29 | 8.83 | 1694.96 | 11.60 | 1692.19 |
| 1 | 51.25 | 1669.20 | 1697.20 | 1687.50 | 16.80 | 1688.70 | 16.42 | 1689.08 | 19.00 | 1686.50 |
| 2 | 152.00 | 1669.69 | 1697.69 | 1686.25 | 20.00 | 1685.50 | 18.00 | 1687.50 | 22.00 | 1683.50 |
| | 172.00 | | | 1686.25 | | | 18.67 | 1686.83 | | |
| 3 | 252.00 | 1669.98 | 1698.38 | 1687.50 | 19.50 | 1686.00 | 19.08 | 1686.42 | 21.60 | 1683.90 |
| | 272.00 | | | 1686.25 | | | 20.58 | 1684.92 | | |
| | 292.00 | | | 1682.50 | | | | | 22.70 | 1682.80 |
| 4 | 352.00 | 1669.40 | 1698.40 | 1687.50 | 21.50 | 1684.06 | 19.50 | 1686.06 | 20.80 | 1684.76 |
| | 372.00 | | | 1685.00 | | | 18.67 | 1686.89 | | |
| | 392.00 | | | 1681.75 | | | | | 21.10 | 1684.46 |
| | 432.00 | | | 1681.75 | 21.50 | 1684.06 | | | | |
| | 442.75 | | | 1681.75 | | | 26.42 | 1679.15 | | |
| 5 | 452.75 | 1669.63 | 1698.63 | 1681.75 | 27.50 | 1679.25 | 25.33 | 1681.42 | 25.90 | 1680.85 |
| | 492.75 | | | 1681.75 | 26.00 | 1680.75 | | | 28.40 | 1678.35 |
| 6 | 553.50 | 1669.40 | 1698.40 | 1681.75 | 23.80 | 1681.76 | 21.58 | 1683.98 | 21.50 | 1684.06 |
| | 573.50 | | | 1685.00 | 23.80 | 1681.76 | 19.75 | 1685.81 | | |
| | 593.50 | | | 1685.00 | | | | | 22.30 | 1683.26 |
| 7 | 653.50 | 1669.38 | 1698.38 | 1685.00 | 20.50 | 1685.00 | 20.00 | 1685.50 | 22.30 | 1683.20 |
| 8 | 753.50 | 1669.69 | 1697.69 | 1684.13 | 17.00 | 1688.50 | 16.33 | 1689.17 | 18.70 | 1686.80 |
| | 773.50 | | | 1684.13 | | | 15.25 | 1690.25 | | |
| | 793.50 | | | 1685.00 | | | | | 18.20 | 1686.68 |
| 9 | 854.25 | 1669.20 | 1697.20 | 1685.63 | 17.00 | 1687.25 | 16.58 | 1687.67 | 19.20 | 1685.05 |
| N-A | 915.50 | 1670.00 | 1696.27 | 1686.25 | 9.70 | 1694.69 | 9.17 | 1695.22 | 11.70 | 1692.69 |

| Year | 1965 | 1967 | 1969 | 1970 | 1971 | 1973 | 1975 | 1979 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1680.06 | 1679.56 | 1680.76 | 1678.76 | 1678.56 | 1678.46 | 1679.26 | 1677.96 |

| Year | 1982 | 1984 | 1986 | 1989 | 1990 | 1991 | 1993 | 1994 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1678.56 | 1678.06 | 1676.56 | 1676.56 | 1676.56 | 1678.66 | 1676.56 | 1676.06 |

**Table 12. Structure, Cross-section, and Flowline Details**
**Bridge No 13679 (RS 6) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b13679 | 3.1 MI E Dewey C/L | 36-03-18 | 98-34-54 | S.H. 51 | 1956 | 444.50 |

| Pier-No | Distance | Pier-BTM | Pier-Top | R-bed56 | S-Rding91 | R-bed91 |
|---|---|---|---|---|---|---|
| W-A | 0.00 | 1540.00 | 1575.00 | 1571.5 | 7.00 | 1573.18 |
| 1 | 51.50 | 1540.00 | 1575.76 | 1570.00 | 12.30 | 1567.88 |
| 2 | 137.25 | 1530.89 | 1575.89 | 1571.50 | 14.80 | 1565.38 |
| 3 | 222.25 | 1531.19 | 1576.13 | 1557.50 | 19.60 | 1560.58 |
| | 264.75 | | | 1556.50 | 23.40 | 1556.78 |
| 4 | 307.25 | 1530.89 | 1575.89 | 1568.13 | 17.30 | 1562.88 |
| 5 | 393.00 | 1539.00 | 1575.76 | 1570.00 | 10.60 | 1569.58 |
| E-A | 444.50 | 1538.00 | 1576.25 | 1570.00 | 7.00 | 1573.50 |

| Year | 1959 | 1965 | 1969 | 1970 | 1971 | 1973 | 1974 | 1976 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1557.18 | 1557.18 | 1557.08 | 1556.18 | 1555.78 | 1554.88 | 1554.78 | 1554.58 |

| Year | 1979 | 1982 | 1984 | 1987 | 1989 | 1991 | 1991 | 1995 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1555.58 | 1555.38 | 1555.58 | 1555.28 | 1555.68 | 1557.58 | 1553.58 | 1557.88 |

| Year | 1999 | 2002 | 2004 |
|---|---|---|---|
| Flowline | 1556.43 | 1553.51 | 1557.18 |

**Table 13. Structure, and Flowline Details**
**Bridge No 13655 (RS 7) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b13655 | 3.5 MI. E Dewey C/L | 36-03-18 | 98-34-36 | S.H. 51 | 1956 | 150.90 |

| Year | 1965 | 1976 | 1984 | 1991 | 1995 | 1999 | 2002 |
|---|---|---|---|---|---|---|---|
| **Flowline** | 1561.40 | 1561.00 | 1561.80 | 1561.70 | 1562.00 | 1561.67 | 1561.59 |

**Table 14. Structure, Cross-section, and Flowline Details**
**Bridge No 20864 (RS 8)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b20864 | 10.2 MI E Dewey C/L | 35-50-30 | 98-27-54 | U.S. 270 | 1984 | 540.58 |

| Pier-No | Distance | Pier-BTM | Pier-Top | R-bed84 | S-Rding87 | R-bed87 |
|---|---|---|---|---|---|---|
| E-A | 0.00 | 1463.00 | 1492.00 | 1490.00 | 10.60 | 1490.80 |
| 1 | 70.29 | 1449.67 | 1493.17 | 1480.00 | 20.00 | 1481.40 |
| 2 | 170.29 | 1448.44 | 1493.44 | 1480.00 | 21.80 | 1479.60 |
| | 220.29 | | | 1478.00 | 30.00 | 1471.40 |
| 3 | 270.29 | 1449.06 | 1493.55 | 1474.00 | 21.70 | 1479.70 |
| 4 | 370.29 | 1451.07 | 1493.57 | 1474.00 | 21.00 | 1480.40 |
| 5 | 470.29 | 1451.42 | 1493.42 | 1480.00 | 20.30 | 1481.10 |
| W-A | 540.58 | 1464.00 | 1492.00 | 1490.00 | 9.00 | 1492.74 |

| Year | 1984 | 1987 | 1989 | 1991 | 1995 | 2004 |
|---|---|---|---|---|---|---|
| Flowline | 1474.30 | 1472.90 | 1472.40 | 1471.40 | 1477.40 | 1472.40 |

**Table 15. Structure, Cross-section, and Flowline Details**
**Bridge No 05523 (RS 9) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b05523 | 10.5 MI E Dewey C/L | 35-50-30 | 98-27-54 | U.S. 270 | 1937 | 809.50 |

| Pier-No | Distance | Pier-BTM | Pier-Top | R-bed37 | S-Rding91 | R-bed91 |
|---|---|---|---|---|---|---|
| E-A | 0.00 | 1463.03 | 1494.18 | 1491.25 | 6.00 | 1488.88 |
| 1 | 103.08 | 1459.81 | 1494.18 | 1481.75 | 18.00 | 1475.00 |
| 2 | 204.00 | 1459.68 | 1494.18 | 1477.50 | 19.00 | 1475.25 |
| 3 | 304.92 | 1459.31 | 1494.18 | 1475.00 | 23.50 | 1470.75 |
| | 355.38 | | | 1475.00 | 26.00 | 1468.88 |
| 4 | 405.83 | 1459.99 | 1494.18 | 1475.00 | 20.00 | 1475.50 |
| 5 | 506.75 | 1459.68 | 1494.18 | 1477.50 | 19.00 | 1476.50 |
| 6 | 607.67 | 1459.68 | 1494.18 | 1478.75 | 19.00 | 1476.50 |
| 7 | 708.58 | 1459.68 | 1494.18 | 1478.13 | 17.00 | 1478.50 |
| W-A | 809.50 | 1463.37 | 1494.18 | 1492.50 | 7.00 | 1488.50 |

| Year | 1954 | 1959 | 1965 | 1970 | 1971 | 1973 | 1974 | 1976 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1468.20 | 1468.50 | 1468.50 | 1468.40 | 1468.40 | 1467.90 | 1467.70 | 1467.50 |

| Year | 1979 | 1982 | 1984 | 1987 | 1989 | 1991 | 1995 |
|---|---|---|---|---|---|---|---|
| Flowline | 1467.60 | 1467.20 | 1466.40 | 1465.00 | 1467.50 | 1467.50 | 1469.17 |

**Table 16. Structure, Cross-section, and Flowline Details**
**Bridge No 26237 (RS 10)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| B18134 | 2.2 MI S. SH. 33 | 35-48-48 | 98-25-12 | U.S. 270 | 1971 | 400.00 |

| PIER_NO | DISTANCE | PIER_BTM | PIER_TOP | R_BED 71 | S_RDING 00 | R_BED 00 | WSE 00 |
|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 1440.19 | 1477.48 | 1475.00 | 9.70 | 1477.80 | 1479.50 |
| 1 | 100.00 | 1435.00 | 1477.50 | 1467.50 | 27.20 | 1459.05 | 1460.75 |
| 2 | 200.00 | 1435.08 | 1477.58 | 1460.45 | 22.70 | 1463.55 | 1465.25 |
| 3 | 300.00 | 1436.00 | 1477.50 | 1467.50 | 19.20 | 1467.05 | 1468.75 |
| N-A | 400.00 | 1438.29 | 1477.48 | 1475.00 | 11.20 | 1476.30 | 1478.00 |

| Year | 1971 | 1973 | 1974 | 1976 | 1979 | 1984 |
|---|---|---|---|---|---|---|
| Flowline | 1460.45 | 1460.45 | 1460.45 | 1460.25 | 1461.95 | 1459.85 |

| Year | 1987 | 1989 | 1990 | 1992 | 1995 |
|---|---|---|---|---|---|
| Flowline | 1461.05 | 1460.25 | 1460.05 | 1460.25 | 1461.25 |

**Table 17. Structure, and Flowline Details**
**Bridge No 26237 (RS 11)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b26237 | 2.2 N. JCT. S.H. 66 | Missing | Missing | U.S. 81 | 2000 | 602.50 |

| Year | 2005 |
|---|---|
| Flowline | 1295.77 |

**Table 18. Structure, Cross-section, and Flowline Details**
**Bridge No 18608 (RS 12) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b18608 | 2.2 MI. N. JCT. SH 66 | 35-33-30 | 97-57-30 | U.S. 81 | 1973 | 602.77 |

| Pier-No | Distance | Pier-BTM | Pier-Top | R-bed73 | S-Rding88 | R-bed88 | S-Rding91 | R-bed91 |
|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 1266.30 | 1325.42 | 1323.00 | | | 10.90 | 1322.85 |
| | 50.32 | | | 1314.50 | 19.50 | 1314.75 | | |
| 1 | 100.63 | 1266.40 | 1325.93 | 1311.00 | 22.70 | 1311.80 | 23.40 | 1311.10 |
| 2 | 201.01 | 1267.40 | 1326.23 | 1311.00 | 22.30 | 1312.45 | 22.90 | 1311.85 |
| 3 | 301.39 | 1267.60 | 1326.33 | 1313.50 | 21.60 | 1313.15 | 22.60 | 1312.15 |
| 4 | 401.76 | 1265.48 | 1326.23 | 1305.00 | 34.40 | 1300.35 | 33.90 | 1300.85 |
| | 413.00 | | | 1301.00 | | | | |
| | 430.26 | | | 1301.50 | | | 35.60 | 1299.15 |
| | 454.76 | | | 1304.00 | | | | |
| | 465.76 | | | 1304.00 | | | | |
| | 476.76 | | | 1304.00 | | | | |
| 5 | 502.14 | 1265.48 | 1325.03 | 1304.00 | 27.50 | 1307.00 | 30.40 | 1304.10 |
| | 552.46 | | | 1313.50 | 17.90 | 1316.35 | | |
| N-A | 602.77 | 1266.30 | 1325.42 | 1323.00 | | | 10.40 | 1323.35 |

| S-Rding92 | R-bed92 | S-Rding94 | R-bed94 | S-Rding98 | R-bed98 | S-Rding00 | R-bed00 |
|---|---|---|---|---|---|---|---|
| 10.90 | 1322.85 | 10.62 | 1323.13 | 10.69 | 1323.06 | 10.60 | 1323.15 |
| | | | | | | | |
| 23.60 | 1310.90 | 22.99 | 1311.51 | 23.09 | 1311.41 | 22.90 | 1311.60 |
| 23.00 | 1311.75 | 22.44 | 1312.31 | 22.90 | 1311.85 | 22.70 | 1312.05 |
| 22.70 | 1312.05 | 21.39 | 1313.36 | 21.81 | 1312.94 | 21.40 | 1313.35 |
| 34.50 | 1300.25 | 34.71 | 1300.04 | 35.82 | 1298.93 | 35.40 | 1299.35 |
| | | | | 35.89 | 1298.86 | | |
| | | | | | | | |
| | | | | | | 35.90 | 1298.85 |
| | | 36.48 | 1298.02 | | | | |
| 35.50 | 1299.00 | | | | | | |
| 27.80 | 1306.70 | 26.90 | 1307.60 | 25.98 | 1308.52 | 26.30 | 1308.20 |
| | | | | | | | |
| 10.50 | 1323.25 | 10.49 | 1323.26 | 10.30 | 1323.45 | 10.10 | 1323.65 |

**Table 18. (Continued)**

| Year | 1973 | 1975 | 1981 | 1984 | 1985 | 1990 | 1991 | 1992 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1302.25 | 1302.55 | 1301.85 | 1301.15 | 1300.75 | 1299.95 | 1300.05 | 1301.25 |

| Year | 1993 | 2005 |
|---|---|---|
| Flowline | 1298.85 | 1302.75 |

**Table 19. Structure, Cross-section, and Flowline Details**
**Bridge No 12832 (RS 13) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b12832 | 2.0 MI. N. JCT. SH 66 | 35-32-12 | 97-44-30 | S.H. 4 | 1952 | 177.00 |

| Pier-No | Distance | Pier-BTM | Pier-Top | R-bed52 | S-Rding88 | R-bed88 |
|---|---|---|---|---|---|---|
| S-A | 0.00 | 1235.75 | 1267.33 | 1264.5 | | |
| 1 | 26.00 | 1235.50 | 1267.33 | 1258.00 | 4.50 | 1265.50 |
| 2 | 51.00 | 1235.50 | 1267.33 | 1258.00 | 5.10 | 1264.90 |
| 3 | 76.00 | 1235.00 | 1267.33 | 1258.00 | 5.90 | 1264.10 |
| 4 | 101.00 | 1235.00 | 1267.33 | 1258.00 | 5.70 | 1265.30 |
| 5 | 126.00 | 1235.00 | 1267.33 | 1258.00 | 5.00 | 1266.00 |
| 6 | 151.00 | 1235.00 | 1267.33 | 1258.00 | 5.20 | 1265.80 |
| N-A | 177.00 | 1235.75 | 1267.33 | 1265.00 | | |

| Year | 1955 | 1960 | 1965 | 1966 | 1967 | 1969 | 1970 |
|---|---|---|---|---|---|---|---|
| Flowline | 1261.50 | 1263.00 | 1263.00 | 1263.00 | 1259.50 | 1257.60 | 1258.50 |

| Year | 1981 | 1985 | 1988 | 1990 | 1991 | 1994 | 2005 |
|---|---|---|---|---|---|---|---|
| Flowline | 1265.80 | 1258.00 | 1260.20 | 1257.80 | 1256.40 | 1258.00 | 1258.50 |

**Table 20. Structure, Cross-section, and Flowline Details**
**Bridge No 12820 (RS 14)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b12820 | 2.3MI. N. JCT. SH66 | 35-32-30 | 97-44-30 | S.H. 4 | 1952 | 127.84 |

| Pier-No | Distance | Pier-BTM | Pier-Top | R-bed52 | S-Rding 88 | R-bed 88 |
|---|---|---|---|---|---|---|
| S-A | 0.00 | 1236.00 | 1267.97 | 1266.00 | | |
| 1 | 26.42 | 1236.00 | 1267.72 | 1263.00 | 8.00 | 1262.75 |
| 2 | 51.42 | 1236.00 | 1267.47 | 1261.50 | 14.20 | 1256.55 |
| | 63.92 | | | 1255.75 | 17.30 | 1253.45 |
| 3 | 76.42 | 1235.50 | 1267.22 | 1261.50 | 16.00 | 1254.75 |
| 4 | 101.42 | 1235.50 | 1266.97 | 1262.00 | 11.00 | 1259.75 |
| N-A | 127.84 | 1236.00 | 1266.75 | 1265.00 | | |

| Year | 1955 | 1958 | 1960 | 1965 | 1967 | 1969 | 1970 | 1972 | 1975 |
|---|---|---|---|---|---|---|---|---|---|
| Flowline | 1261.05 | 1261.65 | 1258.25 | 1258.15 | 1258.35 | 1258.95 | 1259.15 | 1257.25 | 1255.15 |

| Year | 1981 | 1984 | 1985 | 1988 | 1990 | 1991 | 1995 | 2005 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1257.15 | 1255.75 | 1255.25 | 1253.45 | 1254.05 | 1254.25 | 1254.75 | 1254.95 |

**Table 21. Structure, Cross-section, and Flowline Details**
**Bridge No 18352 (RS 15)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b18352 | 22 MI. N. JCT. SH 66 | 35-32-18 | 97-44-30 | S.H.4 | 1972 | 330.50 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed72 | S-Rding88 | R-bed88 | S-Rding91 | R-bed91 |
|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 1240.00 | 1268.78 | 1271.88 | | | 10.70 | 1266.68 |
| 1 | 95.25 | 1238.92 | 1268.92 | 1255.00 | 25.70 | 1251.05 | 23.00 | 1253.75 |
| | 109.25 | | | 1255.00 | | | | |
| | 125.75 | | | 1255.00 | | | | |
| | 137.75 | | | 1255.00 | | | | |
| | 142.75 | | | 1255.00 | 26.30 | 1250.45 | 27.90 | 1248.85 |
| | 157.25 | | | 1255.00 | | | | |
| | 170.75 | | | 1255.00 | | | | |
| 2 | 190.25 | 1238.92 | 1268.92 | 1257.50 | 25.40 | 1251.98 | 27.20 | 1250.18 |
| 3 | 260.25 | 1244.63 | 1269.63 | 1264.38 | 18.00 | 1260.00 | 18.00 | 1260.00 |
| N-A | 330.50 | 1240.00 | 1268.55 | 1271.88 | | | 10.80 | 1267.20 |

| S-Rding92 | R-bed92 | S-Rding93 | R-bed93 | S-Rding93 | R-bed93 | S-Rding94 | R-bed94 |
|---|---|---|---|---|---|---|---|
| 10.60 | 1266.78 | 10.70 | 1266.68 | 10.60 | 1266.78 | 9.51 | 1267.86 |
| 21.10 | 1255.65 | 22.90 | 1253.85 | 22.20 | 1254.55 | 26.84 | 1249.91 |
| | | | | | | | |
| | | | | | | | |
| 27.00 | 1249.75 | 29.00 | 1247.75 | | | | |
| | | | | 27.30 | 1249.45 | | |
| | | | | | | | |
| | | | | | | | |
| 28.00 | 1249.38 | 31.80 | 1245.58 | 28.90 | 1248.48 | 26.71 | 1250.67 |
| 18.00 | 1260.00 | 17.80 | 1260.20 | 17.80 | 1260.20 | 16.47 | 1261.53 |
| 11.30 | 1266.70 | 11.10 | 1266.90 | 11.10 | 1266.90 | 9.88 | 1268.12 |

**Table 21. (Continued)**

| S-Rding98 | R-bed98 | S-Rding00 | R-bed00 | S-Rding05 | R-bed05 |
|---|---|---|---|---|---|
| 10.86 | 1266.52 | 11.10 | 1266.28 | 10.60 | 1266.78 |
| 19.46 | 1257.29 | 21.40 | 1255.35 | 20.10 | 1256.65 |
| 28.38 | 1248.37 | | | | |
| | | | | 26.30 | 1250.45 |
| | | | | | |
| | | | | | |
| | | 27.30 | 1249.45 | | |
| | | | | 24.70 | 1252.05 |
| 29.17 | 1248.21 | 27.50 | 1249.88 | 25.70 | 1251.68 |
| 17.42 | 1260.58 | 17.50 | 1260.50 | 17.40 | 1260.60 |
| 10.89 | 1267.11 | 10.90 | 1267.10 | 10.70 | 1267.30 |

| Year | 1972 | 1973 | 1975 | 1981 | 1984 | 1985 | 1988 | 1991 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1251.88 | 1252.58 | 1253.88 | 1251.48 | 1250.88 | 1250.38 | 1248.58 | 1249.98 |

| Year | 1993 | 1994 | 2005 |
|---|---|---|---|
| Flowline | 1245.58 | 1249.88 | 1251.68 |

**Table 22. Structure, Cross-section, and Flowline Details**
**Bridge No 14208 (RS 16) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b14208 | 0.3 MI E Canadian C/L | 35-30-54 | 97-40-00 | U.S. 66 | 1958 | 803.50 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed58 | S-Rding93 | R-bed93 | S-Rding94 | R-bed94 |
|---|---|---|---|---|---|---|---|---|
| W-A | 0.00 | 1225.00 | 1254.04 | 1252.50 | 5.90 | 1255.07 | 7.67 | 1253.30 |
| 1 | 101.00 | 1225.09 | 1254.09 | 1245.00 | 18.30 | 1242.95 | 17.48 | 1243.77 |
| 2 | 201.00 | 1225.59 | 1254.59 | 1245.00 | 18.90 | 1242.35 | 17.97 | 1243.28 |
| 3 | 301.00 | 1225.54 | 1250.54 | 1243.75 | 18.70 | 1242.55 | 18.53 | 1242.72 |
| 4 | 401.75 | 1225.94 | 1254.94 | 1242.50 | 19.00 | 1242.88 | 18.79 | 1243.09 |
| 5 | 502.50 | 1225.54 | 1254.54 | 1237.50 | 20.50 | 1240.75 | 25.88 | 1235.37 |
| 6 | 602.50 | 1198.59 | 1254.59 | 1235.00 | 36.70 | 1224.55 | 31.29 | 1229.96 |
| | 652.50 | | | 1232.50 | 36.10 | 1225.15 | 34.58 | 1226.67 |
| 7 | 702.50 | 1198.09 | 1254.09 | 1226.25 | 36.00 | 1224.63 | 32.18 | 1228.45 |
| E-A | 803.50 | 1225.00 | 1254.04 | 1250.00 | 9.00 | 1251.99 | 9.67 | 1251.32 |

| Year | 1965 | 1970 | 1982 | 1984 | 1986 | 1988 | 1994 | 2005 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1237.75 | 1232.95 | 1232.85 | 1248.25 | 1233.25 | 1234.95 | 1228.77 | 1234.65 |

**Table 23. Structure, Cross-section, and Flowline Details**
**Bridge No 16189 (RS 17) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b16189 | 1MI E Canadian Co | 35-27-36 | 97-40-12 | I-40 | 1964 | 804.00 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed64 | S-Rding88 | R-bed88 | S-Rding93 | R-bed93 |
|---|---|---|---|---|---|---|---|---|
| W-A | 0.00 | 1188.00 | 1230.12 | 1228.75 | | | 11.60 | 1228.40 |
| | 50.00 | | | | | | | |
| 1 | 101.00 | 1183.58 | 1230.58 | 1211.75 | 27.30 | 1212.70 | 28.90 | 1211.10 |
| 2 | 201.00 | 1182.86 | 1230.86 | 1211.75 | 27.50 | 1212.50 | 30.90 | 1209.10 |
| 3 | 301.00 | 1183.98 | 1230.98 | 1200.00 | 36.60 | 1203.40 | 36.00 | 1204.00 |
| | 351.38 | | | 1202.50 | | | | |
| 4 | 401.75 | 1183.92 | 1230.92 | 1206.25 | 35.60 | 1204.40 | 37.00 | 1203.00 |
| 5 | 502.50 | 1183.98 | 1230.98 | 1202.50 | 29.60 | 1210.40 | 37.60 | 1202.40 |
| | 543.50 | | | 1200.75 | | | | |
| | 552.50 | | | 1200.75 | | | | |
| 6 | 602.50 | 1183.86 | 1230.86 | 1197.50 | 37.40 | 1202.60 | 43.00 | 1197.00 |
| | 662.50 | | | 1202.50 | 42.80 | 1197.20 | 44.70 | 1195.30 |
| | 683.50 | | | 1205.00 | | | | |
| 7 | 702.50 | 1182.58 | 1230.58 | 1208.13 | 41.00 | 1199.00 | 31.70 | 1208.30 |
| E-A | 803.50 | 1187.00 | 1230.12 | 1227.50 | | | 9.70 | 1230.30 |

**Table 23. (Continued)**

| S-Rding93 | R-bed93 | S-Rding94 | R-bed94 | S-Rding00 | R-bed00 | S-Rding05 | R-bed05 |
|---|---|---|---|---|---|---|---|
| 10.90 | 1229.10 | 8.70 | 1231.30 | 10.60 | 1229.40 | 11.70 | 1228.30 |
| | | | | | | 26.70 | 1213.30 |
| 29.00 | 1211.00 | 27.00 | 1213.00 | 29.30 | 1210.70 | 30.00 | 1210.00 |
| 29.00 | 1211.00 | 27.00 | 1213.00 | 29.70 | 1210.30 | 31.90 | 1208.10 |
| 39.30 | 1200.70 | 37.50 | 1202.50 | 38.90 | 1201.10 | 39.70 | 1200.30 |
| | | 42.00 | 1198.00 | | | 42.80 | 1197.20 |
| 33.30 | 1206.70 | 32.50 | 1207.50 | 44.10 | 1195.90 | 44.00 | 1196.00 |
| 38.00 | 1202.00 | 35.00 | 1205.00 | 44.30 | 1195.70 | 44.20 | 1195.80 |
| | | | | 44.40 | 1195.60 | | |
| | | 42.50 | 1197.50 | | | 44.50 | 1195.50 |
| 40.90 | 1199.10 | 39.00 | 1201.00 | 38.20 | 1201.80 | 42.90 | 1197.10 |
| 45.90 | 1194.10 | | | | | 45.60 | 1194.40 |
| | | | | 48.00 | 1192.00 | | |
| 45.90 | 1194.10 | 44.00 | 1196.00 | 49.00 | 1191.00 | 43.00 | 1197.00 |
| 10.90 | 1229.10 | 9.00 | 1231.00 | 10.10 | 1229.90 | 11.10 | 1228.90 |

| Year | 1970 | 1975 | 1981 | 1984 | 1986 | 1988 | 1990 |
|---|---|---|---|---|---|---|---|
| Flowline | 1207.80 | 1200.50 | 1200.60 | 1200.00 | 1197.40 | 1197.20 | 1196.70 |

| Year | 1994 | 2005 |
|---|---|---|
| Flowline | 1196.00 | 1192.50 |

**Table 24. Structure, Cross-section, and Flowline Details**
**Bridge No 16190 (RS 18)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b16190 | 0.1 MI E Canadian Co. | 35-27-36 | 97-40-12 | I-40 | 1964 | 803.50 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed64 | S-Rding88 | R-bed88 | S-Rding94 | R-bed94 |
|---|---|---|---|---|---|---|---|---|
| W-A | 0.00 | 1187.50 | 1230.12 | 1228.25 | | | 10.00 | 1228.75 |
| 1 | 101.00 | 1183.58 | 1230.58 | 1200.00 | 27.30 | 1211.45 | 27.00 | 1211.75 |
| 2 | 201.00 | 1182.86 | 1230.86 | 1205.00 | 29.00 | 1209.75 | 33.00 | 1205.75 |
| 3 | 301.00 | 1183.98 | 1230.98 | 1202.50 | 35.80 | 1202.95 | 34.00 | 1204.75 |
| 4 | 401.75 | 1183.92 | 1230.92 | 1202.50 | 38.90 | 1199.85 | 35.00 | 1203.75 |
| 5 | 502.50 | 1183.98 | 1230.98 | 1201.88 | 37.00 | 1202.38 | 38.00 | 1201.38 |
| 6 | 602.50 | 1183.86 | 1230.86 | 1207.50 | 39.40 | 1199.98 | 43.00 | 1196.38 |
| | 640.50 | | | 1197.50 | | | | |
| | 642.50 | | | 1197.50 | 40.50 | 1198.88 | 44.50 | 1194.88 |
| | 650.50 | | | | | | | |
| 7 | 702.50 | 1182.58 | 1230.58 | 1195.00 | 30.50 | 1208.25 | 29.00 | 1209.75 |
| E-A | 803.50 | 1186.25 | 1230.12 | 1230.12 | | | 8.00 | 1230.75 |

| S-Rding00 | R-bed00 | S-Rding05 | R-bed05 |
|---|---|---|---|
| 11.50 | 1227.25 | 12.40 | 1226.35 |
| 29.00 | 1209.75 | 29.60 | 1209.15 |
| 32.20 | 1206.55 | 33.10 | 1205.65 |
| 35.60 | 1203.15 | 37.00 | 1201.75 |
| 36.30 | 1202.45 | 43.80 | 1194.95 |
| 40.40 | 1198.98 | 42.80 | 1196.58 |
| 45.40 | 1193.98 | 42.60 | 1196.78 |
| 45.00 | 1194.38 | | |
| | | | |
| | | 47.70 | 1191.68 |
| 31.70 | 1207.05 | 32.70 | 1206.05 |
| 9.10 | 1229.65 | 10.10 | 1228.65 |

| Year | 1970 | 1975 | 1981 | 1984 | 1986 | 1988 | 1990 | 1994 | 2005 |
|---|---|---|---|---|---|---|---|---|---|
| Flowline | 1207.58 | 1199.68 | 1199.48 | 1199.88 | 1196.78 | 1198.88 | 1196.08 | 1194.88 | 1191.68 |

**Table 25. Structure, and Flowline Details**
**Bridge No 27867 (RS 19) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b27867 | 0.25 E I-35/I-40 Ft. Smith | 35-28-06 | 97-28-00 | I-40 WB TO I-35 NB | 2003 | 660.60 |

| Year | 2005 |
|---|---|
| Flowline | 1148.00 |

**Table 26. Structure, Cross-section, and Flowline Details**
**Bridge No 21357 (RS 20) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b21357 | 2MI E JCT I-35 | 35-29-36 | 97-25-42 | U.S. 62 | 1986 | 1,000.50 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed86 | S-Rding93 | R-bed93 |
|---|---|---|---|---|---|---|
| W-A | 0.00 | 1120.000 | 1166.47 | 1160.00 | 9.50 | 1160.50 |
| 1 | 100.25 | 1112.390 | 1161.89 | 1145.00 | 25.00 | 1146.25 |
| 2 | 200.25 | 1110.770 | 1162.76 | 1142.50 | 25.80 | 1145.45 |
| 3 | 300.25 | 1109.105 | 1163.60 | 1142.50 | 26.30 | 1146.20 |
| 4 | 400.25 | 1108.590 | 1164.36 | 1143.75 | 30.30 | 1143.45 |
| 5 | 500.25 | 1107.055 | 1164.55 | 1144.38 | 36.80 | 1138.20 |
|  | 550.25 |  |  | 1138.75 | 34.50 | 1140.50 |
| 6 | 600.25 | 1105.640 | 1164.13 | 1137.50 | 32.40 | 1142.60 |
| 7 | 700.25 | 1104.375 | 1163.37 | 1141.25 | 29.10 | 1144.65 |
| 8 | 800.25 | 1096.040 | 1162.54 | 1145.00 | 27.20 | 1143.43 |
| 9 | 900.25 | 1087.655 | 1161.66 | 1147.50 | 25.00 | 1145.00 |
| E-A | 1000.5 | 1110.000 | 1166.19 | 1160.00 | 11.20 | 1158.18 |

| Year | 1988 | 1990 | 1994 | 2005 |
|---|---|---|---|---|
| Flowline | 1140.25 | 1140.45 | 1143.36 | 1142.25 |

**Table 27. Structure, Cross-section, and Flowline Details**
**Bridge No 21129 (RS 21) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b21129 | 17.5 MI E OF JCT I-35 | 35-29-36 | 97-09-42 | U.S. 62 | 1985 | 900.34 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed85 | S-Rding90 | R-bed90 | S-Rding93 | R-bed93 |
|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 1030.00 | 1080.00 | 1080.00 | 12.60 | 1079.90 | 12.70 | 1079.80 |
| 1 | 100.17 | 1020.62 | 1082.62 | 1073.75 | 24.40 | 1065.60 | 23.80 | 1066.20 |
| 2 | 200.17 | 1019.45 | 1081.45 | 1073.75 | 24.60 | 1065.40 | 28.20 | 1061.80 |
| 3 | 300.17 | 1020.46 | 1080.46 | 1072.50 | 33.50 | 1056.50 | 29.80 | 1060.20 |
| | 330.17 | | | 1042.75 | | | 40.80 | 1049.20 |
| 4 | 400.17 | 1013.92 | 1079.92 | 1060.00 | 33.00 | 1057.00 | 29.00 | 1061.00 |
| | 450.17 | | | 1055.63 | 34.10 | 1054.03 | | |
| 5 | 500.17 | 1011.44 | 1079.44 | 1056.25 | 34.90 | 1052.60 | 22.80 | 1064.70 |
| 6 | 600.17 | 1013.87 | 1078.87 | 1063.75 | 27.30 | 1060.20 | 27.50 | 1060.00 |
| 7 | 700.17 | 1011.48 | 1078.48 | 1062.50 | 23.10 | 1064.40 | 21.20 | 1066.30 |
| 8 | 800.17 | 1012.00 | 1078.00 | 1061.75 | 21.70 | 1065.80 | 21.80 | 1065.70 |
| N-A | 900.34 | 1030.00 | 1077.44 | 1061.75 | 12.20 | 1074.05 | 12.30 | 1073.95 |

| Year | 1986 | 1988 | 1990 | 1994 | 2005 |
|---|---|---|---|---|---|
| Flowline | 1055.30 | 1053.20 | 1053.40 | 1049.81 | 1052.50 |

**Table 28. Structure, Cross-section, and Flowline Details**
**Bridge No 05040 (RS 22)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b05040 | 0.7 MI N OF SH 270 | 35-26-48 | 97-05-24 | S.H. 102 | 1936 | 340.00 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed36 | S-Rding92 | R-bed92 | S-Rding93 | R-bed93 |
|---|---|---|---|---|---|---|---|---|
| N-A | 0.00 | 1007.85 | 1060.47 | 1058.76 | 8.80 | 1063.32 | 9.20 | 1062.92 |
| | 15.00 | | | 1058.76 | 14.40 | 1057.72 | 15.00 | 1057.12 |
| | 30.00 | | | 1058.76 | | | | |
| 1 | 40.00 | 1007.85 | 1060.47 | 1058.76 | 13.40 | 1058.72 | 15.10 | 1057.02 |
| | 56.00 | | | 1056.03 | | | | |
| | 58.00 | | | 1056.03 | | | | |
| | 59.00 | | | 1056.03 | | | | |
| | 62.00 | | | 1056.03 | | | | |
| | 68.00 | | | 1055.12 | | | | |
| 2 | 80.00 | 1007.85 | 1060.47 | 1052.40 | 20.40 | 1050.81 | 21.20 | 1050.01 |
| | 95.00 | | | 1051.49 | | | | |
| | 98.00 | | | 1051.03 | | | | |
| | 101.00 | | | 1050.58 | | | | |
| | 105.00 | | | 1050.12 | 22.60 | 1048.61 | 20.00 | 1051.21 |
| | 108.00 | | | 1049.67 | | | | |
| | 113.00 | | | 1047.85 | | | | |
| 3 | 120.00 | 1007.85 | 1060.47 | 1045.35 | 22.60 | 1048.61 | 29.50 | 1041.71 |
| | 138.00 | | | 1044.21 | | | | |
| | 145.00 | | | 1043.30 | | | | |
| | 161.00 | | | 1041.49 | | | | |
| | 168.00 | | | 1041.49 | 28.70 | 1042.51 | | |
| | 172.00 | | | 1041.03 | | | | |
| | 175.00 | | | 1040.58 | | | | |
| | 180.00 | | | 1041.03 | | | | |
| | 190.00 | | | 1042.40 | | | | |
| | 200.00 | | | 1043.30 | | | | |
| | 202.00 | | | 1043.30 | | | | |
| | 205.00 | | | 1043.76 | | | | |
| | 210.00 | | | 1044.21 | | | | |
| | 211.00 | | | 1044.21 | | | | |
| | 212.00 | | | 1044.21 | | | | |
| 4 | 220.00 | 1007.85 | 1060.47 | 1045.12 | 21.40 | 1050.72 | 26.80 | 1045.32 |
| | 226.00 | | | 1045.35 | | | | |

**Table 28. (Continued)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 239.00 | | | 1046.03 | | | | |
| | 242.00 | | | 1046.49 | | | | |
| | 255.00 | | | 1047.85 | | | | |
| 5 | 260.00 | 1007.85 | 1060.47 | 1050.58 | 25.20 | 1046.01 | 21.30 | 1049.91 |
| | 261.00 | | | 1050.58 | | | | |
| | 270.00 | | | 1051.49 | | | 25.80 | 1045.41 |
| | 272.00 | | | 1051.71 | | | | |
| | 275.00 | | | 1051.94 | | | | |
| | 278.00 | | | 1052.17 | | | | |
| | 285.00 | | | 1052.40 | | | | |
| | 286.00 | | | 1052.40 | | | | |
| 6 | 300.00 | 1007.85 | 1060.47 | 1055.12 | 16.20 | 1055.01 | 18.50 | 1052.71 |
| | 305.00 | | | 1056.03 | | | | |
| | 309.00 | | | 1056.03 | | | | |
| | 310.00 | | | 1056.03 | | | | |
| S-A | 340.00 | 1007.85 | 1060.47 | 1058.30 | 8.80 | 1062.41 | 9.50 | 1061.71 |

| S-Rding95 | R-bed95 | S-Rding96 | R-bed96 | S-Rding97 | R-bed97 | S-Rding99 | R-bed99 |
|---|---|---|---|---|---|---|---|
| 10.70 | 1061.42 | 10.80 | 1061.32 | 10.82 | 1061.30 | 11.00 | 1061.12 |
| | | | | | | | |
| | | | | | | | |
| 31.90 | 1040.22 | 25.60 | 1046.52 | 26.57 | 1045.55 | 29.10 | 1043.02 |
| | | | | | | | |
| | | | | | | | |
| 32.80 | 1039.32 | | | | | | |
| | | | | | | | |
| | | 22.40 | 1049.72 | | | | |
| 28.30 | 1042.91 | 26.30 | 1044.91 | 19.68 | 1051.53 | 23.10 | 1048.11 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 23.40 | 1047.81 | | | | | | |
| | | | | 24.93 | 1046.28 | | |
| 26.80 | 1044.41 | 27.20 | 1044.01 | 23.95 | 1047.26 | 36.50 | 1034.71 |
| | | | | | | | |
| | | | | | | 29.90 | 1041.31 |
| | | | | 24.93 | 1046.28 | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | 32.80 | 1038.41 |
| 23.30 | 1047.91 | | | | | | |

**Table 28. (Continued)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 28.20 | 1043.01 | | | | | | |
| | | 22.90 | 1048.31 | | | | |
| | | | | | | | |
| | | | | | | | |
| 25.60 | 1045.61 | 25.40 | 1045.81 | 19.02 | 1052.19 | 24.30 | 1046.91 |
| | | | | | | | |
| | | | | 18.04 | 1053.17 | | |
| | | | | | | | |
| 15.50 | 1055.71 | | | | | | |
| 15.90 | 1055.31 | 15.80 | 1055.41 | 19.02 | 1052.19 | 19.70 | 1051.51 |
| 16.90 | 1054.31 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | 20.01 | 1051.20 | | |
| | | | | | | 16.40 | 1054.81 |
| 22.30 | 1048.91 | | | | | | |
| | | 22.40 | 1048.81 | | | | |
| 17.70 | 1053.51 | 20.10 | 1051.11 | 19.02 | 1052.19 | 16.80 | 1054.41 |
| 18.80 | 1052.41 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 8.50 | 1062.71 | 9.10 | 1062.11 | 10.17 | 1061.04 | 10.10 | 1061.11 |

| S-Rding02 | R-bed02 | S-Rding03 | R-bed03 | S-Rding04 | R-bed04 |
|---|---|---|---|---|---|
| 10.80 | 1061.32 | 11.00 | 1061.12 | 10.60 | 1061.52 |
| | | | | | |
| | | | | | |
| 25.10 | 1047.02 | 25.30 | 1046.82 | 23.80 | 1048.32 |
| 23.40 | 1048.72 | | | | |
| | | | | 22.00 | 1050.12 |
| | | | | | |
| | | 24.40 | 1047.72 | | |
| | | | | | |
| 26.20 | 1045.01 | 26.00 | 1045.21 | 27.90 | 1043.31 |
| 25.30 | 1045.91 | | | | |
| | | 25.10 | 1046.11 | 25.90 | 1045.31 |
| 27.10 | 1044.11 | | | | |
| | | | | | |
| | | | | | |

**Table 28. (Continued)**

| | | | | | |
|---|---|---|---|---|---|
| 25.40 | 1045.81 | 28.90 | 1042.31 | | |
| 27.10 | 1044.11 | 27.70 | 1043.51 | 28.10 | 1043.11 |
| 27.30 | 1043.91 | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | 25.70 | 1045.51 |
| | | | | | |
| | | | | | |
| | | | | 29.80 | 1041.41 |
| 22.90 | 1048.31 | 23.00 | 1048.21 | | |
| | | | | 22.20 | 1049.01 |
| | | | | | |
| | | | | | |
| | | 25.30 | 1045.91 | | |
| 25.50 | 1045.71 | | | | |
| 24.20 | 1047.01 | 24.40 | 1046.81 | 24.60 | 1046.61 |
| 21.20 | 1050.01 | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 20.40 | 1050.81 | 20.80 | 1050.41 | 21.00 | 1050.21 |
| | | | | | |
| | | | | | |
| | | | | | |
| 15.40 | 1055.81 | 15.60 | 1055.61 | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 16.20 | 1055.01 | 16.90 | 1054.31 | 16.00 | 1055.21 |
| | | | | | |
| 16.70 | 1054.51 | | | | |
| | | | | 16.20 | 1055.01 |
| 10.10 | 1061.11 | 10.00 | 1061.21 | 10.00 | 1061.21 |

| Year | 1970 | 1977 | 1980 | 1983 | 1985 | 1992 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 1052.71 | 1047.01 | 1046.81 | 1046.61 | 1046.21 | 1042.51 | 1042.31 | 1043.11 |

**Table 29. Structure, and Flowline Details**
**Bridge No 20576 (RS 23) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b20576 | 0.4 MI E Dale | 35-23-30 | 97-02-24 | S.H. 270 | 1983 | 801.80 |

| Year | 1985 | 1992 | 1994 |
|---|---|---|---|
| Flowline | 1001.25 | 989.25 | 990.65 |

**Table 30. Structure, and Flowline Details**
**Bridge No 15380 (RS 24)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b15380 | 6.1 MI E OK C/L | 35-22-36 | 97-02-18 | I-40 | 1961 | 400.90 |

| Year | 1969 | 1975 | 1987 |
|---|---|---|---|
| Flowline | 1015.17 | 1015.07 | 1013.97 |

**Table 31. Structure, and Flowline Details**
**Bridge No 15381 (RS 25) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b15381 | 6.1 MI E OK C/L | 35-22-36 | 97-02-18 | I-40 | 1961 | 400.90 |

| Year | 1969 | 1975 | 1987 |
|---|---|---|---|
| Flowline | 1014.61 | 1014.51 | 1013.91 |

**Table 32. Structure, and Flowline Details**
**Bridge No 15388 (RS 26)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b15388 | 3.9 MI S JCT SH 3 | 35-18-54 | 96-56-36 | U.S. 270 | 1961 | 803.10 |

| Year | 1963 | 1965 | 1967 | 1969 | 1970 | 1971 | 1973 | 1975 | 1977 |
|---|---|---|---|---|---|---|---|---|---|
| Flowline | 976.77 | 974.47 | 974.47 | 974.67 | 974.47 | 974.27 | 974.47 | 973.97 | 974.47 |

| Year | 1980 | 1983 | 1985 | 1987 | 1992 | 1994 | 2003 | 2005 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 972.97 | 971.97 | 975.67 | 974.37 | 972.97 | 972.97 | 972.97 | 972.57 |

**Table 33. Structure, and Flowline Details**
**Bridge No 19276 (RS 27) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b19276 | 2.2 MI E JCT SH 18 | 35-20-00 | 96-52-18 | S.H. 3E | 1976 | 852.00 |

| Year | 1977 | 1980 | 1983 | 1985 | 1992 | 1994 | 2003 |
|---|---|---|---|---|---|---|---|
| Flowline | 958.00 | 955.60 | 956.00 | 955.00 | 954.00 | 953.90 | 953.30 |

**Table 34. Structure, and Flowline Details**
**Bridge No 15865 (RS 28)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b15865 | N/S | N/A | N/A | N/A | 1962 | N/A |

| Year | 1969 | 1971 | 1973 | 1975 | 1980 | 1985 | 1987 | 1989 | 1990 |
|---|---|---|---|---|---|---|---|---|---|
| Flowline | 927.77 | 929.47 | 929.27 | 928.07 | 929.27 | 927.27 | 927.07 | 926.27 | 925.97 |

| Year | 1991 | 1995 |
|---|---|---|
| Flowline | 926.27 | 931.17 |

**Table 35. Structure, and Flowline Details**
**Bridge No 15864 (RS 29)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b15864 | N/A | N/A | N/A | N/A | 1962 | N/A |

| Year | 1969 | 1971 | 1973 | 1975 | 1980 | 1985 | 1987 | 1989 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 927.47 | 929.47 | 929.27 | 929.27 | 929.47 | 926.57 | 928.27 | 926.27 |

| Year | 1990 | 1991 | 1995 |
|---|---|---|---|
| Flowline | 926.07 | 926.27 | 930.77 |

**Table 36. Structure, and Flowline Details**
**Bridge No 22683 (RS 30)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b22683 | Pott-Seminole C/L | 35-23-54 | 96-40-12 | S.H. 99 | 1990 | 812.00 |

| Year | 1992 | 2003 |
|---|---|---|
| Flowline | 867.55 | 866.45 |

**Table 37. Structure, and Flowline Details**
**Bridge No 22686 (RS 31)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b22686 | 2.5 MI E Seminole Co. | 35-25-48 | 96-24-30 | S.H. 56 | 1990 | 1,501.00 |

| Year | 2003 | 2005 |
|---|---|---|
| Flowline | 783.60 | 783.60 |

**Table 38. Structure, and Flowline Details**
**Bridge No 22666 (RS 32) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b22666 | 3.4 MI E Seminole Co. | 35-25-42 | 96-23-24 | S.H. 56 | 1990 | 211.00 |

| Year | 1992 | 2003 | 2005 |
|---|---|---|---|
| Flowline | 801.44 | 800.84 | 800.84 |

**Table 39. Structure, Cross-section, and Flowline Details**
**Bridge No 15870 (RS 33)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b15870 | 2.5 MI E Seminole Co | 35-23-36 | 096-24-06 | I-40 | 1962 | 1,687.75 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed62 | S-Rding00 | R-bed00 |
|---|---|---|---|---|---|---|
| W-A | 0.00 | 757.00 | 802.00 | 802.00 | 9.67 | 789.33 |
| 1 | 61.25 | 752.77 | 802.77 | 792.00 | 19.33 | 779.67 |
| 2 | 162.00 | 753.03 | 803.03 | 792.00 | 22.00 | 777.00 |
| 3 | 262.00 | 752.70 | 803.70 | 792.00 | 21.67 | 777.33 |
| 4 | 362.00 | 752.83 | 803.83 | 792.00 | 23.33 | 775.67 |
| 5 | 462.75 | 753.38 | 804.34 | 788.00 | 24.75 | 774.25 |
| 6 | 563.50 | 752.64 | 804.64 | 788.00 | 25.25 | 773.75 |
| | 583.50 | | | 788.00 | 25.50 | 773.50 |
| 7 | 663.50 | 752.31 | 805.31 | 788.00 | 25.41 | 773.59 |
| 8 | 763.50 | 752.44 | 805.44 | 788.00 | 26.00 | 773.00 |
| | 783.50 | | | 790.00 | 25.67 | 773.33 |
| 9 | 864.25 | 751.99 | 805.99 | 790.00 | 25.25 | 773.75 |
| 10 | 964.25 | 753.24 | 806.24 | 790.00 | 25.50 | 773.50 |
| 11 | 1064.25 | 752.91 | 806.91 | 791.75 | 26.50 | 772.50 |
| | 1084.25 | | | 791.75 | 26.33 | 772.67 |
| 12 | 1164.25 | 755.04 | 807.04 | 789.00 | 27.25 | 771.75 |
| | 1184.25 | | | 788.00 | 27.41 | 771.59 |
| 13 | 1265.00 | 756.59 | 807.59 | 787.00 | 27.00 | 772.00 |
| | 1285.00 | | | 786.50 | 26.58 | 772.42 |
| 14 | 1385.75 | 757.85 | 807.85 | 785.00 | 27.08 | 771.92 |
| 16 | 1585.75 | 763.65 | 808.65 | 776.00 | 40.67 | 758.33 |
| E-A | 1687.75 | 780.00 | 808.00 | 806.00 | 9.41 | 789.59 |

| Year | 1969 | 1975 | 1980 | 1989 | 1990 | 1992 | 1995 |
|---|---|---|---|---|---|---|---|
| Flowline | 758.40 | 758.20 | 757.00 | 756.00 | 759.10 | 758.70 | 762.20 |

**Table 40. Structure, Cross-section, and Flowline Details**
**Bridge No 15871 (RS 34) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b15871 | 2.5 MI. E. Seminole Co | 35-23-36 | 96-24-06 | I-40 | 1963 | 1,668.50 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed63 | S-Rding00 | R-bed00 |
|---|---|---|---|---|---|---|
| W-A | 0.00 | 758.00 | 802.58 | 802.00 | 10.17 | 801.33 |
| | 20.00 | | | 794.00 | 16.25 | 795.25 |
| 1 | 61.25 | 731.52 | 803.58 | 791.75 | 20.17 | 791.83 |
| | 81.25 | | | 791.75 | 20.58 | 791.67 |
| 2 | 162.00 | 742.41 | 802.91 | 791.75 | 20.75 | 791.75 |
| | 182.00 | | | 791.75 | 21.50 | 791.00 |
| 3 | 262.00 | 742.56 | 803.58 | 792.00 | 22.67 | 789.83 |
| | 282.00 | | | 791.75 | 23.42 | 789.08 |
| 4 | 362.00 | 742.21 | 803.71 | 788.00 | 24.33 | 788.42 |
| | 382.00 | | | 788.00 | 24.67 | 788.33 |
| 5 | 462.75 | 742.99 | 804.99 | 786.00 | 25.33 | 787.92 |
| | 482.75 | | | 786.00 | 24.75 | 788.75 |
| 6 | 563.50 | 743.02 | 804.52 | 788.25 | 25.25 | 789.25 |
| | 583.50 | | | 788.25 | 25.67 | 789.08 |
| 7 | 663.50 | 742.69 | 805.19 | 788.25 | 26.17 | 788.58 |
| | 683.50 | | | 788.25 | 25.33 | 789.42 |
| 8 | 763.50 | 741.82 | 805.32 | 788.00 | 26.25 | 788.50 |
| | 783.50 | | | 788.00 | 26.08 | 788.67 |
| 9 | 864.25 | 743.60 | 806.60 | 788.00 | 25.75 | 789.75 |
| | 884.25 | | | 788.00 | 25.17 | 790.33 |
| 10 | 965.00 | 744.12 | 806.12 | 789.00 | 25.75 | 790.25 |
| 11 | 1065.00 | 743.79 | 806.79 | 789.00 | 26.25 | 790.00 |
| | 1085.00 | | | 787.00 | 27.25 | 789.00 |
| 12 | 1165.00 | 744.92 | 806.92 | 787.00 | 27.25 | 789.25 |
| | 1185.00 | | | 787.00 | 27.08 | 789.67 |
| 13 | 1265.75 | 747.20 | 808.20 | 786.00 | 26.75 | 790.00 |
| | 1285.75 | | | 786.00 | 26.67 | 790.08 |
| 14 | 1366.50 | 750.73 | 807.73 | 787.00 | 30.75 | 786.75 |
| 15 | 1466.50 | 753.90 | 808.40 | 780.00 | 37.75 | 780.25 |
| | 1476.50 | | | 779.00 | 39.00 | 779.25 |
| | 1561.50 | | | 777.00 | 41.08 | 777.42 |
| 16 | 1566.50 | 758.03 | 808.53 | 777.75 | 36.08 | 782.42 |
| | 1571.50 | | | 777.75 | 41.00 | 777.50 |
| E-A | 1668.50 | 766.00 | 809.20 | 809.75 | 10.42 | 808.08 |

| Year | 1969 | 1975 | 1980 | 1989 | 1990 | 1992 | 1995 |
|---|---|---|---|---|---|---|---|
| Flowline | 777.90 | 776.50 | 777.50 | 777.50 | 775.30 | 776.20 | 777.50 |

**Table 41. Structure, Cross-section, and Flowline Details**
**Bridge No 18361 (RS 35) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b18361 | 1.8 MI S JCT 140 | 35-22-30 | 96-22-12 | S.H.48 | 1972 | 590.50 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed72 | S-Rding87 | R-bed87 | S-Rding92 | R-bed92 | S-Rding97 | R-bed97 |
|---|---|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 765.00 | 793.92 | 791.81 | | | 8.90 | 790.65 | 10.00 | 789.55 |
| 1 | 70.25 | 760.40 | 793.40 | 782.76 | 21.40 | 779.06 | 21.20 | 779.26 | 22.00 | 778.46 |
| | 110.25 | | | 782.76 | | | 20.90 | 780.01 | | |
| 2 | 140.25 | 760.98 | 795.98 | 781.86 | 21.30 | 779.61 | 21.20 | 779.71 | 22.00 | 778.91 |
| 3 | 210.25 | 760.62 | 795.62 | 784.57 | 21.90 | 779.01 | 21.50 | 779.41 | 22.50 | 778.41 |
| | 295.25 | | | 779.10 | | | 23.50 | 776.96 | | |
| 4 | 305.25 | 758.93 | 795.93 | 772.76 | 29.90 | 770.56 | 28.00 | 772.46 | 28.50 | 771.96 |
| | 342.25 | | | 768.19 | | | 40.00 | 760.46 | | |
| | 352.75 | | | 768.19 | 37.30 | 763.16 | | | 43.00 | 757.46 |
| 5 | 400.25 | 755.95 | 795.98 | 770.00 | 36.50 | 763.96 | 34.70 | 765.76 | 36.00 | 764.46 |
| | 454.25 | | | 767.29 | | | 40.40 | 760.06 | | |
| 6 | 495.25 | 755.66 | 795.66 | 760.00 | 24.10 | 776.36 | 27.60 | 772.86 | 27.50 | 772.96 |
| | 542.88 | | | 760.00 | 20.70 | 779.76 | | | | |
| N-A | 590.50 | 760.00 | 795.08 | 790.00 | | | 9.90 | 789.65 | 9.50 | 790.05 |

| Year | 1973 | 1975 | 1981 | 1983 | 1987 | 1989 | 1990 | 1992 | 1994 |
|---|---|---|---|---|---|---|---|---|---|
| Flowline | 764.06 | 764.66 | 761.96 | 761.46 | 763.16 | 762.46 | 762.66 | 760.06 | 763.46 |

**Table 42. Structure, Cross-section, and Flowline Details**
**Bridge No 10570 (RS 36)on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b10570 | 4.2 MI NW Hughes Co | 35-20-00 | 96-18-00 | S.H. 27 | 1946 | 810.00 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed46 | S-Rding01 | R-bed01 | S-Rding99 | R-bed99 |
|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 727.00 | 770.34 | 770.34 | 8.53 | 774.31 | 8.40 | 774.44 |
| 1 | 52.08 | 724.75 | 770.34 | 747.75 | 22.96 | 759.88 | 22.90 | 759.94 |
| | 65.08 | | | 747.75 | | | | |
| | 97.08 | | | 747.75 | | | | |
| | 109.08 | | | 747.75 | | | | |
| | 118.08 | | | 747.75 | | | | |
| | 119.08 | | | 747.75 | 21.65 | 761.19 | 21.00 | 761.84 |
| | 142.08 | | | 747.75 | | | | |
| | 147.08 | | | 747.75 | | | | |
| | 151.08 | | | 747.75 | | | | |
| 2 | 152.92 | 721.42 | 772.93 | 747.75 | 25.26 | 757.58 | 26.00 | 756.84 |
| | 164.92 | | | 747.75 | | | 24.00 | 758.84 |
| | 167.92 | | | 747.75 | 23.62 | 759.22 | | |
| | 170.92 | | | 747.75 | | | | |
| | 172.92 | | | 747.75 | | | | |
| | 177.92 | | | 747.75 | | | | |
| | 184.92 | | | 747.75 | | | | |
| | 194.92 | | | 747.75 | 31.16 | 751.68 | | |
| | 198.92 | | | 747.75 | | | 30.50 | 752.34 |
| | 202.92 | | | 747.75 | | | | |
| | 213.92 | | | 747.75 | 23.95 | 758.89 | | |
| | 219.92 | | | 747.75 | | | 27.90 | 754.94 |
| | 220.92 | | | 747.75 | | | | |
| 3 | 253.75 | 713.73 | 772.93 | 747.75 | 34.77 | 748.07 | 36.00 | 746.84 |
| | 278.75 | | | 747.75 | | | | |
| | 283.75 | | | 747.75 | 35.76 | 747.08 | | |
| | 293.75 | | | 747.75 | | | | |
| | 295.75 | | | 745.17 | | | | |
| | 303.79 | | | 745.17 | | | | |
| | 304.75 | | | 745.17 | | | | |
| | 343.75 | | | 745.17 | | | 33.00 | 749.84 |
| | 344.75 | | | 742.58 | 33.13 | 749.71 | | |
| 4 | 354.59 | 715.12 | 772.93 | 742.58 | 33.79 | 749.05 | 37.00 | 745.84 |
| | 366.59 | | | 745.17 | | | 33.10 | 749.74 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 367.59 | | | 745.17 | | | | |
| | 384.59 | | | 745.17 | | | 33.50 | 749.34 |
| | 389.59 | | | 745.17 | | | | |
| | 390.59 | | | 745.17 | | | | |
| | 392.59 | | | 745.17 | | | | |
| | 399.59 | | | 745.17 | | | | |
| | 409.59 | | | 745.17 | | | 36.00 | 746.84 |
| | 413.59 | | | 745.17 | | | | |
| | 416.59 | | | 745.17 | | | | |
| | 417.59 | | | 745.17 | | | | |
| | 429.59 | | | 745.17 | | | | |
| | 430.59 | | | 745.17 | | | 34.30 | 748.54 |
| | 433.59 | | | 745.17 | 36.18 | 746.66 | | |
| 5 | 455.42 | 720.49 | 772.93 | 745.17 | 35.10 | 747.74 | 34.90 | 747.94 |
| | 476.42 | | | 745.17 | | | 28.30 | 754.54 |
| | 493.42 | | | 745.17 | | | | |
| | 520.42 | | | 745.17 | | | | |
| | 520.42 | | | 745.17 | | | | |
| | 543.42 | | | 745.17 | | | | |
| 6 | 556.25 | 716.35 | 772.93 | 745.17 | 21.65 | 761.19 | 22.00 | 760.84 |
| | 600.25 | | | 747.55 | | | | |
| | 645.25 | | | 747.55 | | | | |
| 7 | 657.09 | 717.07 | 772.93 | 747.55 | 22.96 | 759.88 | 23.00 | 759.84 |
| | 696.09 | | | 747.55 | | | | |
| | 697.09 | | | 747.55 | | | | |
| | 702.09 | | | 747.55 | | | | |
| 6 | 556.25 | 716.35 | 772.93 | 745.17 | 21.65 | 761.19 | 22.00 | 760.84 |
| | 705.09 | | | 747.55 | | | | |
| | 723.09 | | | 747.55 | | | 22.80 | 760.04 |
| | 724.09 | | | 747.55 | 22.30 | 760.54 | | |
| 8 | 757.92 | 717.83 | 770.34 | 747.55 | 22.96 | 759.88 | 23.00 | 759.84 |
| N-A | 810.00 | 720.00 | 770.34 | 770.34 | 6.23 | 776.61 | 5.50 | 777.34 |

**Table 42. (Continued)**

| S-Rding98 | R-bed98 | S-Rding97 | R-bed97 | S-Rding96 | R-bed96 | S-Rding95 | R-bed 95 |
|---|---|---|---|---|---|---|---|
| 8.10 | 774.74 | 8.20 | 774.64 | 5.40 | 777.44 | 7.70 | 775.14 |
| 22.90 | 759.94 | 22.96 | 759.88 | 23.10 | 759.74 | 22.80 | 760.04 |
| | | 22.30 | 760.54 | | | | |
| | | | | | | | |
| | | | | 22.60 | 760.24 | | |
| | | | | | | 21.10 | 761.74 |
| | | | | | | | |
| 20.80 | 762.04 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 26.10 | 756.74 | 24.60 | 758.24 | 23.00 | 759.84 | 24.60 | 758.24 |
| | | | | | | | |
| | | | | | | | |
| 24.30 | 758.54 | | | | | | |
| | | 31.49 | 751.35 | | | | |
| | | 28.54 | 754.30 | | | | |
| 29.90 | 752.94 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 25.30 | 757.54 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 35.00 | 747.84 | 33.79 | 749.05 | 22.30 | 760.54 | 34.70 | 748.14 |
| 36.10 | 746.74 | | | | | | |
| | | | | | | | |
| | | | | | | 37.20 | 745.64 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | 31.80 | 751.04 |
| | | | | | | | |
| 32.00 | 750.84 | 36.08 | 746.76 | 36.10 | 746.74 | 34.60 | 748.24 |
| | | | | | | | |
| | | 35.10 | 747.74 | | | | |
| | | | | | | 32.00 | 750.84 |
| | | | | | | 34.80 | 748.04 |
| | | | | 41.00 | 741.84 | | |
| | | | | | | | |
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 34.70 | 748.14 | | | | | | |
| | | | | | | 41.60 | 741.24 |
| | | | | 38.00 | 744.84 | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 34.00 | 748.84 | 37.07 | 745.77 | 33.00 | 749.84 | 37.90 | 744.94 |
| | | | | | | | |
| | | | | 35.20 | 747.64 | | |
| | | | | 34.20 | 748.64 | | |
| | | | | 35.00 | 747.84 | | |
| 22.20 | 760.64 | 22.30 | 760.54 | 34.10 | 748.74 | 22.30 | 760.54 |
| | | | | 26.30 | 756.54 | | |
| | | | | 24.20 | 758.64 | | |
| 22.70 | 760.14 | 22.63 | 760.21 | 25.80 | 757.04 | 22.50 | 760.34 |
| | | | | | | | |
| | | | | | | 22.30 | 760.54 |
| | | | | | | | |
| | | | | 20.30 | 762.54 | | |
| | | | | | | | |
| | | | | | | | |
| 23.30 | 759.54 | 22.96 | 759.88 | 22.70 | 760.14 | 22.90 | 759.94 |
| 6.00 | 776.84 | 6.23 | 776.61 | 7.70 | 775.14 | 5.10 | 777.74 |

**Table 42. (Continued)**

| S-Rding94 | R-bed94 | S-Rding93 | R-bed93 | S-Rding92 | R-bed92 | S-Rding87 | R-bed87 |
|---|---|---|---|---|---|---|---|
| 7.30 | 775.54 | 7.10 | 775.74 | 7.50 | 775.34 | | |
| 22.60 | 760.24 | 22.50 | 760.34 | 23.10 | 759.74 | 20.40 | 762.44 |
| | | | | | | | |
| 21.30 | 761.54 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 24.00 | 758.84 | | | | | | |
| | | | | 22.10 | 760.74 | | |
| 29.90 | 752.94 | 25.40 | 757.44 | 26.00 | 756.84 | 20.60 | 762.24 |
| | | | | | | | |
| | | | | | | | |
| 30.80 | 752.04 | | | | | | |
| | | | | 25.00 | 757.84 | | |
| | | | | | | | |
| | | | | | | | |
| 28.20 | 754.64 | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | 37.40 | 745.44 | | | | |
| 35.30 | 747.54 | 36.40 | 746.44 | 36.00 | 746.84 | 29.60 | 753.24 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | 39.50 | 743.34 | | | | |
| | | | | | | 34.60 | 748.24 |
| | | | | 43.20 | 739.64 | | |
| | | | | | | | |
| | | | | | | | |
| 36.80 | 746.04 | 36.30 | 746.54 | 32.30 | 750.54 | 30.30 | 752.54 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | 25.00 | 757.84 | | | | |
| | | | | 27.10 | 755.74 | | |
| | | | | | | | |

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|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | 31.80 | 751.04 | | |
| | | | | | | | |
| | | | | | | | |
| 33.00 | 749.84 | 37.50 | 745.34 | 30.60 | 752.24 | 30.00 | 752.84 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 22.40 | 760.44 | 22.30 | 760.54 | 22.20 | 760.64 | 19.60 | 763.24 |
| | | | | | | | |
| | | | | | | | |
| 22.50 | 760.34 | 22.00 | 760.84 | 22.80 | 760.04 | 19.80 | 763.04 |
| 22.30 | 760.54 | | | | | | |
| | | | | | | | |
| | | | | 22.60 | 760.24 | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| 22.80 | 760.04 | 22.30 | 760.54 | 23.10 | 759.74 | 20.40 | 762.44 |
| 5.10 | 777.74 | 5.30 | 777.54 | 5.60 | 777.24 | | |

| **Year** | **1954** | **1960** | **1961** | **1962** | **1964** | **1965** | **1966** | **1971** |
|---|---|---|---|---|---|---|---|---|
| **Flowline** | 750.84 | 747.84 | 748.84 | 748.84 | 748.04 | 748.74 | 748.54 | 745.84 |

| **Year** | **1973** | **1981** | **1983** | **1987** | **1989** | **1991** | **1992** | **1994** |
|---|---|---|---|---|---|---|---|---|
| **Flowline** | 742.84 | 746.44 | 746.84 | 748.24 | 746.84 | 746.84 | 743.34 | 745.94 |

**Table 43. Structure, Cross-section, and Flowline Details**
**Bridge No 21128 (RS 37) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b21128 | 2.9 S Okfuskee C/L | 35-15-48 | 96-12-24 | U.S. 75 | 1985 | 800.34 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed85 | S-Rding87 | R-bed87 | S-Rding00 | R-bed00 |
|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 651.88 | 710.00 | 710.00 | | | 8.00 | 710.75 |
| | 50.85 | | | 695.00 | 25.50 | 693.88 | | |
| 1 | 100.17 | 649.45 | 714.95 | 696.25 | 27.50 | 692.50 | 24.75 | 695.25 |
| | 120.17 | | | 693.75 | | | 23.00 | 697.63 |
| 2 | 200.17 | 646.02 | 916.52 | 695.00 | 30.60 | 691.28 | 27.90 | 693.98 |
| 3 | 300.17 | 643.01 | 718.01 | 693.75 | 38.40 | 684.73 | 41.00 | 682.13 |
| | 320.17 | | | 693.75 | | | 42.70 | 681.05 |
| 4 | 400.17 | 642.92 | 719.42 | 685.00 | 41.30 | 683.70 | 38.90 | 686.10 |
| | 410.17 | | | 685.00 | | | 38.10 | 686.90 |
| | 450.85 | | | 685.00 | 46.80 | 678.20 | | |
| 5 | 500.17 | 642.99 | 720.99 | 685.00 | 45.50 | 680.75 | 43.00 | 683.25 |
| 6 | 600.17 | 664.98 | 722.48 | 691.75 | 39.70 | 687.80 | 32.00 | 695.50 |
| 7 | 700.17 | 672.39 | 723.89 | 691.75 | 36.70 | 692.68 | 33.80 | 695.58 |
| | 750.85 | | | 696.25 | 35.60 | 694.40 | | |
| | 766.95 | | | 705.00 | 10.80 | 719.20 | | |
| N-A | 800.34 | 720.00 | 725.46 | 725.00 | | | 6.67 | 724.58 |

| Year | 1985 | 1987 | 1989 | 1991 | 1995 |
|---|---|---|---|---|---|
| Flowline | 678.70 | 680.70 | 680.00 | 680.00 | 684.17 |

**Table 44. Structure, Cross-section, and Flowline Details**
**Bridge No 14189 (RS 38) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b14189 | 1.4 MI N Hughes Co | 35-18-36 | 96-02-06 | S.H. 84 | 1958 | 322.50 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed58 | S-Rding87 | R-bed87 |
|---|---|---|---|---|---|---|
| S-A | 0.00 | 629.38 | 667.67 | 670.00 | | |
| 1 | 41.25 | 629.38 | 667.94 | 656.25 | 15.40 | 659.60 |
| 2 | 81.25 | 628.13 | 668.14 | 656.25 | 15.40 | 659.60 |
| 3 | 121.25 | 628.13 | 668.26 | 656.25 | 15.40 | 659.60 |
| 4 | 161.25 | 628.13 | 668.30 | 656.25 | 15.50 | 659.50 |
| 5 | 201.25 | 628.13 | 668.26 | 656.25 | 15.50 | 659.50 |
| 6 | 241.25 | 628.13 | 668.14 | 658.75 | 15.50 | 659.50 |
| 7 | 281.25 | 626.25 | 667.94 | 658.75 | 14.20 | 660.80 |
| N-A | 322.50 | 626.25 | 667.67 | 665.00 | | |

| Year | 1965 | 1970 | 1975 | 1985 | 1987 | 1989 | 1991 | 1992 |
|---|---|---|---|---|---|---|---|---|
| Flowline | 656.40 | 656.50 | 656.60 | 656.50 | 659.50 | 659.00 | 659.00 | 654.50 |

**Table 45. Structure, Cross-section, and Flowline Details**
**Bridge No 14200 (RS 39) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b14200 | 1.7 MI N Hughes Co | 35-18-48 | 96-02-06 | S.H. 84 | 1958 | 504.50 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed58 | S-Rding87 | R-bed87 | S-Rding92 | R-bed92 | S-Rding97 | R-bed97 | S-Rding00 | R-bed00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 615.00 | 668.10 | 665.00 | | | 10.00 | 664.62 | 9.00 | 665.62 | 7.42 | 665.20 |
| | 17.21 | | | 656.00 | 46.60 | 628.02 | | | | | | |
| 1 | 51.63 | 633.30 | 668.35 | 646.25 | | | 39.00 | 634.75 | 39.00 | 634.75 | 30.33 | 641.42 |
| | 56.63 | | | 646.25 | | | | | | | | |
| | 71.63 | | | 646.25 | | | | | | | 57.08 | 614.67 |
| | 81.63 | | | 646.25 | | | | | 42.00 | 631.75 | | |
| | 142.25 | | | 643.75 | | | | | | | | |
| | 147.25 | | | 643.75 | | | | | | | | |
| 2 | 152.25 | 633.94 | 668.74 | 643.75 | 35.80 | 639.20 | 51.00 | 624.00 | 35.00 | 640.00 | 54.08 | 618.92 |
| | 172.25 | | | 643.75 | | | | | | | | |
| | 242.25 | | | 645.00 | | | | | | | | |
| 3 | 252.25 | 634.21 | 669.21 | 645.00 | 27.00 | 648.00 | 35.90 | 639.10 | 31.00 | 644.00 | 31.42 | 641.58 |
| 4 | 352.25 | 633.74 | 668.74 | 652.50 | 25.00 | 649.38 | 24.90 | 649.48 | 28.00 | 646.38 | 25.00 | 647.38 |
| | 372.25 | | | 652.50 | | | | | | | | |
| | 447.88 | | | 655.00 | | | | | | | | |
| 5 | 452.88 | 633.35 | 668.35 | 655.00 | 19.00 | 655.38 | 21.00 | 653.38 | 20.00 | 654.38 | 19.25 | 653.13 |
| N-A | 504.50 | 615.00 | 668.10 | 667.50 | | | 10.00 | 664.62 | 9.00 | 665.62 | 7.17 | 665.45 |

**Table 45. (Continued)**

| S-Rding04 | R-bed04 | S-Rding05 | R-bed05 |
|---|---|---|---|
| 8.00 | 664.62 | 8.00 | 664.62 |
| | | | |
| 32.58 | 639.17 | 32.42 | 639.33 |
| 40.75 | 631.00 | | |
| | | 43.00 | 628.75 |
| | | | |
| 36.75 | 636.25 | | |
| | | 36.67 | 636.33 |
| 41.42 | 631.58 | 39.25 | 633.75 |
| 33.33 | 639.67 | | |
| 37.67 | 635.33 | | |
| 36.42 | 636.58 | 29.25 | 643.75 |
| 24.33 | 648.04 | 24.17 | 648.21 |
| | | 20.25 | 652.13 |
| | | 20.75 | 651.63 |
| 16.50 | 655.88 | 19.33 | 653.04 |
| 7.75 | 664.87 | 7.58 | 665.04 |

| Year | 1960 | 1961 | 1962 | 1965 | 1966 | 1969 | 1970 | 1971 | 1973 |
|---|---|---|---|---|---|---|---|---|---|
| Flowline | 640.15 | 639.75 | 641.05 | 638.85 | 637.75 | 624.25 | 624.75 | 636.75 | 629.75 |

| Year | 1981 | 1983 | 1985 | 1987 | 1989 | 1990 | 1994 | 1995 | 2005 |
|---|---|---|---|---|---|---|---|---|---|
| Flowline | 633.75 | 635.25 | 620.25 | 625.15 | 619.75 | 619.55 | 620.75 | 620.75 | 628.75 |

**Table 46. Structure, Cross-section, and Flowline Details**
**Bridge No 15585 (RS 40) on North Canadian River**

| Bridge No | Location | Latitude | Longitude | Highway | Design Year | Length |
|---|---|---|---|---|---|---|
| b15585 | 8.6 MI N Pittsburg Co | 35-13-18 | 95-35-48 | U.S. 69 | 1962 | 801.80 |

| Pier-No | Distance | Pier-Btm | Pier-Top | R-bed62 | S-Rding87 | R-bed 87 | S-Rding D/S90 | R-bed D/S90 | S-Rding U/S90 | R-bed U/S90 |
|---|---|---|---|---|---|---|---|---|---|---|
| S-A | 0.00 | 500.00 | 607.14 | 606.00 | 8.50 | 606.00 | 8.50 | 606.00 | 10.00 | 604.50 |
| 1 | 101.25 | 501.50 | 607.31 | 572.00 | 46.00 | 568.50 | 46.00 | 568.50 | 47.00 | 567.50 |
| 2 | 201.25 | 502.70 | 607.72 | 538.00 | 76.00 | 538.50 | 77.50 | 537.00 | 77.00 | 537.50 |
| 3 | 301.25 | 502.50 | 607.81 | 528.00 | 85.00 | 529.50 | 85.00 | 529.50 | 85.50 | 529.00 |
| | 351.25 | | | 530.00 | 87.00 | 527.50 | 86.00 | 528.50 | 86.50 | 528.00 |
| 4 | 401.25 | 503.50 | 608.14 | 530.00 | 91.50 | 523.00 | 92.00 | 522.50 | 90.00 | 524.50 |
| | 451.25 | | | 530.00 | 88.00 | 526.50 | 87.50 | 527.00 | 86.00 | 528.50 |
| 5 | 501.25 | 502.50 | 607.81 | 530.00 | 91.00 | 523.50 | 89.00 | 525.50 | 86.00 | 528.50 |
| 6 | 601.25 | 503.00 | 607.72 | 538.00 | 78.00 | 536.50 | 78.50 | 536.00 | 76.00 | 538.50 |
| 7 | 701.25 | 503.00 | 609.31 | 574.00 | 45.00 | 569.50 | 44.00 | 570.50 | 44.50 | 570.00 |
| N-A | 802.50 | 500.00 | 607.14 | 608.00 | 9.20 | 605.30 | 9.00 | 605.50 | 9.90 | 604.60 |

| S-Rding93 | R-bed93 |
|---|---|
| 8.00 | 606.50 |
| 45.00 | 569.50 |
| 77.00 | 537.50 |
| 84.00 | 530.50 |
| 85.00 | 529.50 |
| 90.00 | 524.50 |
| 86.00 | 528.50 |
| 89.00 | 525.50 |
| 78.00 | 536.50 |
| 44.00 | 570.50 |
| 8.00 | 606.50 |

| Year | 1985 | 1987 | 1989 | 1990.00 | 1992 | 1994 |
|---|---|---|---|---|---|---|
| Flowline | 527.50 | 523.50 | 523.00 | 524.50 | 526.50 | 529.50 |

# APPENDIX B

## FLOW PATH OF NORTH CANADIAN RIVER IN OKLAHOMA

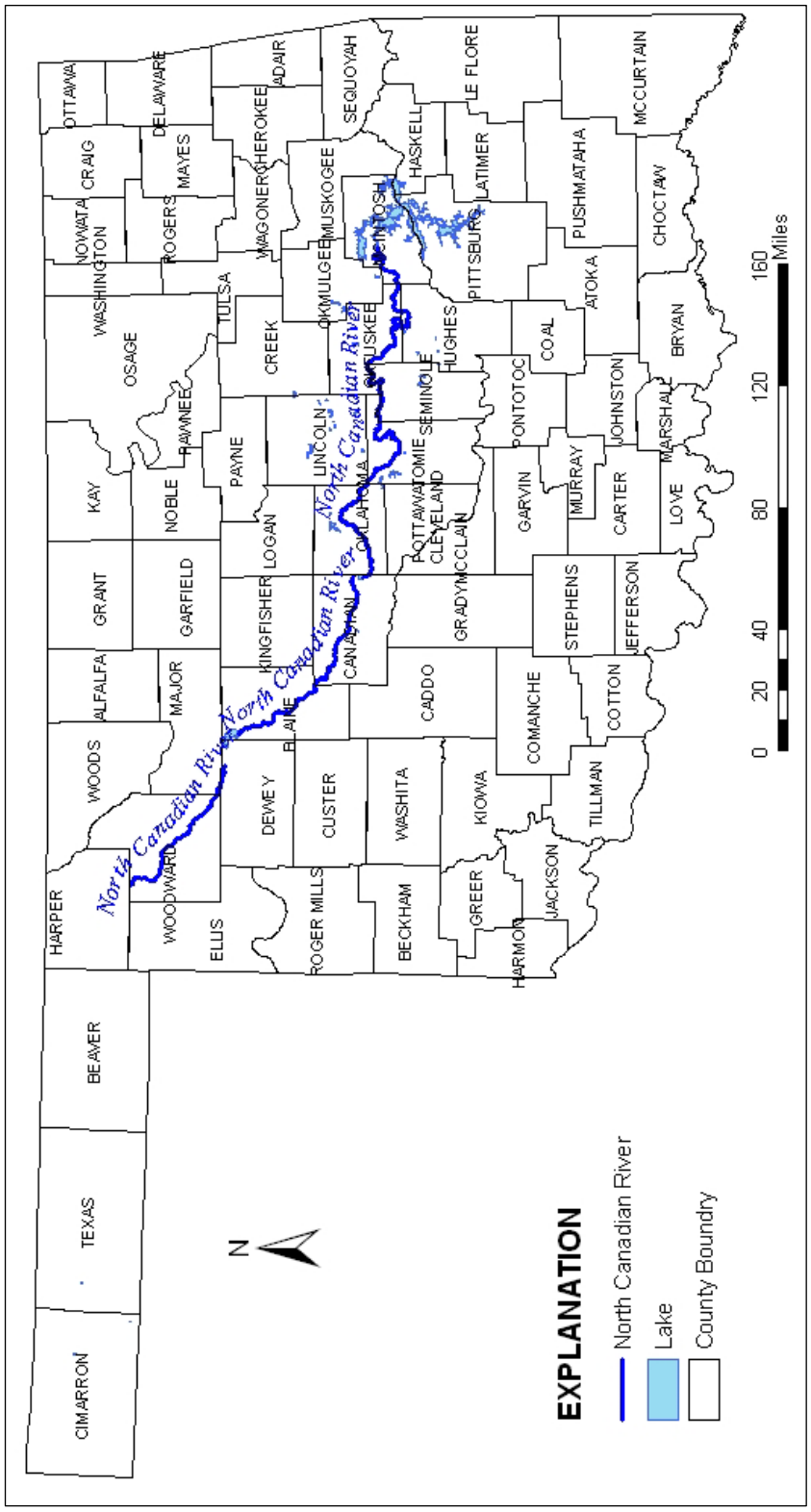


**Figure B-1. Flowpath of North Canadian River in Oklahoma**

**QUAD MAP LEGEND**
**NORTH CANADIAN RIVER, OKLAHOMA**

**Source: http://www.okladot.state.ok.us/hqdiv/p-r-div/maps/2003county/index.htm**

| County Name |
|---|
| Woodward |
| Major |
| Dewey |
| Blaine |
| Canadian |
| Oklahoma |
| Pottawatomie |
| Seminole |
| Okfuskee |
| Hughes |
| McIntosh |
| Pittsburg |
| Haskell |

BLAINE

Copies of this map are available for public use at nominal cost.
Address inquiries to:
OKLAHOMA DEPARTMENT OF TRANSPORTATION
REPRODUCTION BRANCH Phone (405) 521-2586
200 N.E. 21st STREET
OKLAHOMA CITY, OKLAHOMA 73105-3204

This map indicates those roads known to the Department to be open to public travel. Placement of a road on the map has no relationship to maintenance responsibility by any level of government.

MAJOR COUNTY

CANTON WILDLIFE MANAGEMENT AREA
WATERFOWL REFUGE PORTION
CANTON LAKE
CANTON AIRPORT
CANTON POP. 618
LONGDALE POP. 310
HOMESTEAD
OKEENE POP. 1,240
OKEENE MUNICIPAL AIRPORT
DARROW
SOUTHARD
HITCHCOCK POP. 141
EAGLE CITY
ROMAN NOSE STATE PARK
BOECHER LAKE
WATONGA LAKE
WATONGA MUNICIPAL AIRPORT
WATONGA POP. 4,658
GREENFIELD POP. 123
CLUB LAKE
AMERICAN HORSE LAKE
AMERICAN HORSE LAKE HUNTING & FISHING AREA
GROENDYKE RANCH AIRPORT
BLAINE CO. 1,116
CANADIAN CO. 142
GEARY POP. 1,258
HYDRO POP. 1,060
BLAINE CO. 294
CADDO CO. 766
BRIDGEPORT POP. 109
SPRING LAKE
END OF STATE HIGHWAY NO. 58
Okeene
Sandy
Lodge
Carlton
Blaine
Southard
Sand Creek
Elm Creek
Spring Creek
Otter Creek
Cedar Creek
Kingfisher Creek
Chicken Creek
Ridge Creek
Squaw Creek
Horse Creek
Hurley Creek
Dirt Cr.
Fire Canyon
Lamonica Creek
Willow Creek
Copper Creek
Silt Creek
Niemela Creek
Memahaka Creek
Weaver Creek
Rock Creek
Otter Creek
CANADIAN RIVER
NORTH CANADIAN RIVER
CANADIAN INDEPENDENCE RIVER
CIMARRON RIVER
TURKEY CREEK
SALT FORK RED RIVER
GRAINBELT CORPORATION
FAIRVIEW
RINGWOOD
HENNESSEY
SEILING
OAKWOOD
THOMAS
KINGFISHER
CALUMET
HINTON
TODD & LADD RAILROAD
CANADIAN RIVER RAILROAD
STATE OWNED RAILROAD
BOUNDARY
TO I-40
TO FAIRVIEW
TO RINGWOOD
TO HENNESSEY
TO SEILING
TO OAKWOOD
TO THOMAS
TO KINGFISHER
TO CALUMET
TO HINTON
HOMESTEAD, OKLAHOMA
SEC. 5, T 19 N, R 11 W
SOUTHARD, OKLAHOMA
SEC. 10, T 18 N, R 12 W
EAGLE CITY, OKLAHOMA
SEC. 21, T 17 N, R 13 W
SCALE IN MILES
SCALE IN METERS
LEGEND
U.S.NUMBERED HIGHWAY
STATE NUMBERED HIGHWAY
INTERSTATE HIGHWAY ROUTE
PAVED ROAD
GRAVEL ROAD
GRADED & DRAINED ROAD
UNIMPROVED ROAD
PRIMITIVE ROAD
PROJECTED ROAD
RESIDENTIAL ROAD
N0001 COUNTY ROAD ID NO.
MILEAGE BETWEEN POINTS
DIVIDED HIGHWAY, 4 OR MORE LANES
TRAFFIC CIRCLE
HIGHWAY GRADE SEPARATION
TRAFFIC INTERCHANGE
STATE LINE
COUNTY LINE
CIVIL TOWNSHIP LINE
ENCLOSED HIGHWAY, 3 OR MORE LANES
RURAL DEVELOPMENT AREA
GOVERNMENT PROPERTY LINE
MATCH LINE
COUNTY SEAT
TOWN CENTER
CORPORATE LIMITS
CIVIL TOWNSHIP, ROAD IN PLACE
INSET BOUNDARY
ELEVATION ABOVE SEA LEVEL
MOUNTAIN RANGE, BUTTE OR MESA
SMALL MONUMENT
MARSH OR SWAMP LANDS
DRAINAGE DITCH
IRRIGATION DITCH
LAKE, RESERVOIR OR POND WITH DAM
ROAD OVER DAM
DRY LAKE SUBJECT TO FLOOD
SMALL BRIDGES CLOSELY SPACED
HIGHWAY BRIDGE, OVER 20FT. IN LENGTH
GENERAL BRIDGE, LONG CROSSING
ARCH BRIDGE
CONCRETE DIP OR FORD
FORD ROAD ESTABLISHED
INTERMITTENT STREAM
NARROW STREAM
DOCK PIER OR LANDING
TRUSS BRIDGE,W-WOOD,S-STEEL,C-CONCRETE
NAVIGABLE STREAM WITH LOCK & DAM
WIDE STREAM OR RIVER
TRIANGULATION STATION
RAILROAD, ANY NUMBER OF TRACKS
RAILROAD WITH STATION INDICATED
GRADE CROSSING
UNDERPASS, R.R. ABOVE
OVERPASS, R.R. BELOW
RAILROAD ON STREET
MILITARY AIRFIELD
AIRPORT WITH COMPLETE FACILITIES
AIRPORT WITH LIMITED FACILITIES
LANDING STRIP, PRIVATE FIELD
AIRPORT, GENERAL OUTLINE OF FIELD
RUNWAYS SHOWN IN POSITION
ROADSIDE PARK Picnic Grounds
PLAYGROUNDS
BATHING BEACH OR SWIMMING POOL
SCENIC SITE
MOTEL
CAMP OR LODGE, Permanent with buildings
SMALL PARK SP-State, CP-County MP-Municipal, TP-Trailer Park
FOREST RANGER STATION
OBSERVATION OR LOOKOUT TOWER
CAMP SITE
FISH HATCHERY
GOLF COURSE OR COUNTRY CLUB
ATHLETIC FIELD OR AMUSEMENT PARK
FAIGROUNDS, RACE COURSE
DWELLING
NUMBER OF DWELLINGS CLOSELY SPACED
COMBINED BUSINESS AND DWELLING
POST OFFICE
POST OFFICE COMBINATIONS
SEASONAL DWELLINGS
CHURCH OR OTHER RELIGOUS BUILDING
CEMETERY
CHURCH WITH CEMETERY ADJACENT
REST HOME
HOSPITAL
SMALL BUSINESS
INDUSTRY
SAW MILL
MINE SHAFT OR DRIFT
OIL OR GAS FIELD
GAUGING OR PUMPING STATION
WAREHOUSE
GRAVEL PIT
QUARRY
SCHOOL
COMMUNITY HALL OR LODGE
DRIVE-IN THEATER
CORRECTIONAL INSTITUTION
HIGHWAY GARAGE
JUNK YARDS & DUMPS A-Automobile, B-Scrap Building Material, D-Refuse, Garbage or trash dump, F-Sanitary Fill, G-Other
SEWAGE DISPOSAL PLANT
WATER SUPPLY STAND PIPE
POWER PLANT
BOOSTER STATION
POWER SUBSTATION
KOMA TELEVISION OR RADIO STATION
MILITARY INSTALLATION
ALL DATA CURRENT TO DATE OF INVENTORY JULY 1999
ORIGINAL DRAFTING BY W.A.T. JUNE 2001
STATE SYSTEM REVISED TO JUNE 2001
GENERAL HIGHWAY MAP
BLAINE COUNTY
OKLAHOMA
PREPARED BY THE
OKLAHOMA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
SCALE IN MILES
SCALE IN KILOMETERS
LAMBERT CONFORMAL CONIC PROJECTION U.S. & GEODETIC SURVEY DATA
20,000 FOOT GRID; OKLAHOMA PLANE COORDINATE SYSTEM NORTH PROJECTION ZONE.
POPULATION FIGURES BASED ON 1990 U.S. CENSUS
CO. POP. 11,946

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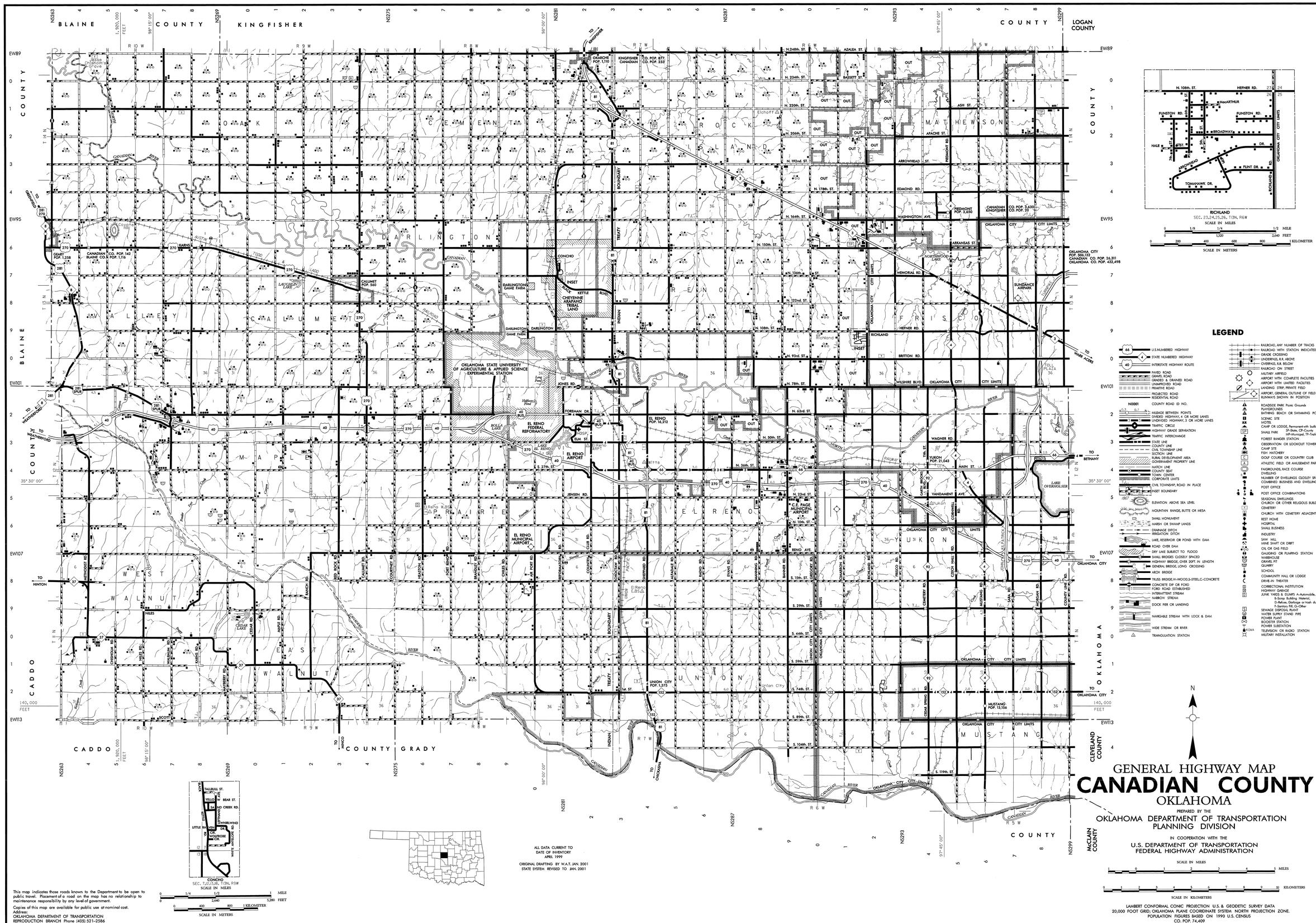





RICHLAND
SEC. 23,24,25,26, T13N, R6W

SCALE IN MILES
0 1/8 1/4 1/2 MILE
0 1,320 2,640 FEET

0 200 400 600 800 1 KILOMETER
SCALE IN METERS

## LEGEND

- U.S.NUMBERED HIGHWAY
- STATE NUMBERED HIGHWAY
- INTERSTATE HIGHWAY ROUTE
- PAVED ROAD
- GRAVEL ROAD
- GRADED & DRAINED ROAD
- UNIMPROVED ROAD
- PRIVATE ROAD
- PROJECTED ROAD
- RESIDENTIAL ROAD
- N0001 COUNTY ROAD ID NO.
- MILEAGE BETWEEN POINTS
- DIVIDED HIGHWAY, 4 OR MORE LANES
- UNDIVIDED HIGHWAY, 3 OR MORE LANES
- TRAFFIC CIRCLE
- HIGHWAY GRADE SEPARATION
- TRAFFIC INTERCHANGE
- STATE LINE
- COUNTY LINE
- CIVIL TOWNSHIP LINE
- SECTION LINE
- RURAL DEVELOPMENT AREA
- GOVERNMENT PROPERTY LINE
- MATCH LINE
- COUNTY SEAT
- TOWN CENTER
- CORPORATE LIMITS
- CIVIL TOWNSHIP, ROAD IN PLACE
- INSET BOUNDARY
- ELEVATION ABOVE SEA LEVEL
- MOUNTAIN RANGE, BUTTE OR MESA
- SMALL MONUMENT
- MARSH OR SWAMP LANDS
- DRAINAGE DITCH
- IRRIGATION DITCH
- LAKE, RESERVOIR OR POND WITH DAM
- ROAD OVER DAM
- DRY LAKE SUBJECT TO FLOOD
- SMALL BRIDGE: CLOSELY SPACED
- HIGHWAY BRIDGE, OVER 20FT. IN LENGTH
- GENERAL BRIDGE, LONG CROSSING
- ARCH BRIDGE
- TRUSS BRIDGE,W-WOOD,S-STEEL,C-CONCRETE
- CONCRETE DIP OR FORD
- FORD ROAD ESTABLISHED
- INTERMITTENT STREAM
- NARROW STREAM
- DOCK PIER OR LANDING
- NAVIGABLE STREAM WITH LOCK & DAM
- WIDE STREAM OR RIVER
- TRIANGULATION STATION
- RAILROAD, ANY NUMBER OF TRACKS
- RAILROAD WITH STATION INDICATED
- GRADE CROSSING
- UNDERPASS, R.R. ABOVE
- OVERPASS, R.R. BELOW
- RAILROAD ON STREET
- MILITARY AIRFIELD
- AIRPORT WITH COMPLETE FACILITIES
- AIRPORT WITH LIMITED FACILITIES
- LANDING STRIP, PRIVATE FIELD
- AIRPORT, GENERAL OUTLINE OF FIELD
- RUNWAYS SHOWN IN POSITION
- ROADSIDE PARK Picnic Grounds
- PLAYGROUNDS
- BATHING BEACH OR SWIMMING POOL
- SCENIC SITE
- MOTEL
- CAMP OR LODGE, Permanent with buildings
- SP-State, CP-County
- SMALL PARK MP-Municipal, TP-Trailer Park
- FOREST RANGER STATION
- OBSERVATION OR LOOKOUT TOWER
- CAMP SITE
- FISH HATCHERY
- GOLF COURSE OR COUNTRY CLUB
- ATHLETIC FIELD OR AMUSEMENT PARK
- FAIRGROUNDS, RACE COURSE
- DWELLING
- NUMBER OF DWELLINGS CLOSELY SPACED
- COMBINED BUSINESS AND DWELLING
- POST OFFICE
- POST OFFICE COMBINATIONS
- SEASONAL DWELLINGS
- CHURCH OR OTHER RELIGIOUS BUILDING
- CEMETERY
- CHURCH WITH CEMETERY ADJACENT
- REST HOME
- HOSPITAL
- SMALL BUSINESS
- INDUSTRY
- SAW MILL
- MINE SHAFT OR DRIFT
- OIL OR GAS FIELD
- GAUGING OR PUMPING STATION
- WAREHOUSE
- GRAVEL PIT
- QUARRY
- SCHOOL
- COMMUNITY HALL OR LODGE
- DRIVE-IN THEATER
- CORRECTIONAL INSTITUTION
- HIGHWAY GARAGE
- JUNK YARDS & DUMPS A-Automobile, S-Scrap Building Material, O-Refuse, Garbage or trash dump, T-Sanitary Fill, C-Other
- SEWAGE DISPOSAL PLANT
- WATER SUPPLY STAND PIPE
- POWER PLANT
- BOOSTER STATION
- POWER SUBSTATION
- TELEVISION OR RADIO STATION
- MILITARY INSTALLATION




CONCHO
SEC. 7,12,13,18, T13N, R9W
SCALE IN MILES
0 1/4 1/2 1 MILE
0 2,640 5,280 FEET
0 400 800 1 KILOMETER
SCALE IN METERS



ALL DATA CURRENT TO DATE OF INVENTORY APRIL 1999

ORIGINAL DRAFTING BY W.A.T. JAN. 2001
STATE SYSTEM REVISED TO JAN. 2001

This map indicates those roads known to the Department to be open to public travel. Placement of a road on the map has no relationship to maintenance responsibility by any level of government.

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REPRODUCTION BRANCH Phone (405) 521-2586
200 N.E. 21st STREET
OKLAHOMA CITY, OKLAHOMA 73105-3204

N

# GENERAL HIGHWAY MAP
# CANADIAN COUNTY
## OKLAHOMA

PREPARED BY THE
OKLAHOMA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION

IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE IN MILES
1 0 1 2 3 4 5 MILES

0 1 2 3 4 5 6 7 8 9 10 KILOMETERS
SCALE IN KILOMETERS

LAMBERT CONFORMAL CONIC PROJECTION U.S. & GEODETIC SURVEY DATA
20,000 FOOT GRID: OKLAHOMA PLANE COORDINATE SYSTEM NORTH PROJECTION ZONE.
POPULATION FIGURES BASED ON 1990 U.S. CENSUS
CO. POP. 74,409

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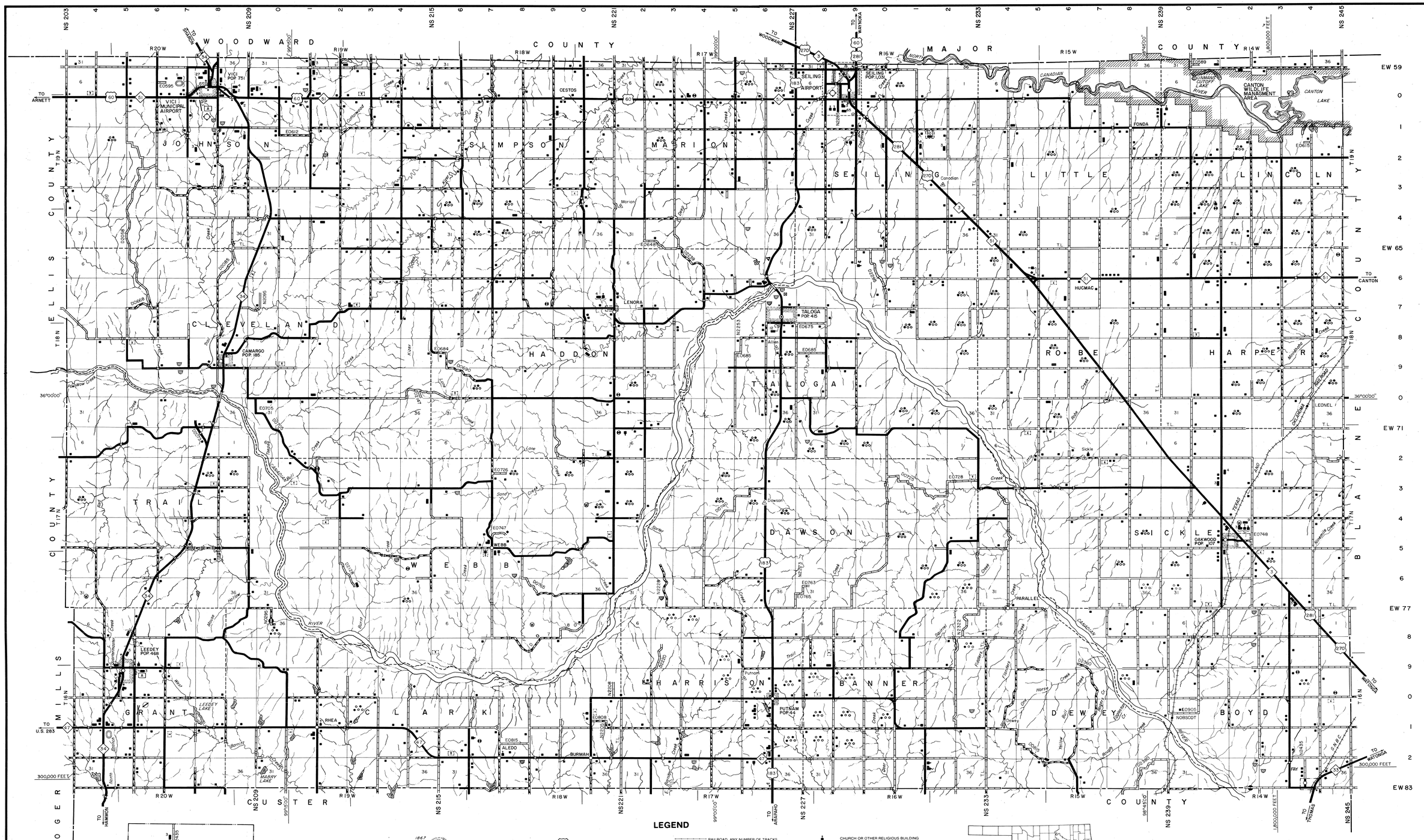


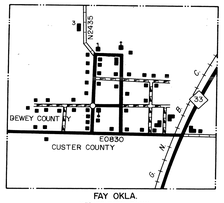


SCALE
0.0 0.1 0.2 0.3 0.4 0.5 MILE

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REPRODUCTION BRANCH Phone (405) 521-2586
200 N.E. 21 st. STREET
OKLAHOMA CITY, OKLAHOMA 73105

## LEGEND

- ELEVATION ABOVE SEA LEVEL
- MOUNTAIN RANGE, BUTTE OR MESA
- SMALL MONUMENT
- MARSH OR SWAMP LANDS
- DRAINAGE DITCH
- IRRIGATION DITCH
- LAKE, RESERVOIR OR POND WITH DAM
- ROAD OVER DAM
- DRY LAKE SUBJECT TO FLOOD
- SMALL BRIDGES CLOSELY SPACED
- HIGHWAY BRIDGE, OVER 20 FT. IN LENGTH
- GENERAL BRIDGE, LONG CROSSING
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- INTERMITTENT STREAM
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- WIDE STREAM OR RIVER
- TRIANGULATION STATION

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- STATE NUMBERED HIGHWAY
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- MATCH LINE
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- TOWN CENTER
- CORPORATE LIMITS
- CIVIL TOWNSHIP, ROAD IN PLACE
- INSET BOUNDARY

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- SEASONAL DWELLINGS

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- CEMETERY
- CHURCH WITH CEMETERY ADJACENT
- REST HOME
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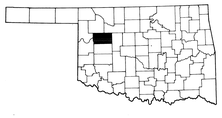
- MILITARY INSTALLATION



ALL DATA CURRENT TO
DATE OF INVENTORY
OCT. 1988

ORIGINAL DRAFTING BY M.J. MAY 1989
STATE SYSTEM REVISED TO JAN. 1992

N

# GENERAL HIGHWAY MAP
# DEWEY COUNTY
## OKLAHOMA

PREPARED BY THE
**OKLAHOMA DEPARTMENT OF TRANSPORTATION**
**PLANNING DIVISION**

IN COOPERATION WITH THE
**U.S. DEPARTMENT OF TRANSPORTATION**
**FEDERAL HIGHWAY ADMINISTRATION**

SCALE
1 0 1 2 3 4 5 MILES

LAMBERT CONFORMAL CONIC PROJECTION U.S COAST & GEODETIC SURVEY DATA
20,000 FOOT GRID: OKLAHOMA PLANE COORDINATE SYSTEM NORTH PROJECTION ZONE
POPULATION FIGURES BASED ON 1990 U.S. CENSUS
CO. POP. 5,551

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## LEGEND

- U.S.NUMBERED HIGHWAY
- STATE NUMBERED HIGHWAY
- INTERSTATE HIGHWAY ROUTE
- PAVED ROAD
- GRAVEL ROAD
- GRADED & DRAINED ROAD
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- MATCH LINE
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- CORPORATE LIMITS
- CIVIL TOWNSHIP, ROAD IN PLACE
- INSET BOUNDARY

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- OVERPASS, R.R. BELOW
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- AIRPORT WITH LIMITED FACILITIES
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- BATHING BEACH OR SWIMMING POOL
- SCENIC SITE
- MOTEL
- CAMP OR LODGE, Permanent with buildings SP–State, CP–County
- SMALL PARK MP–Municipal, TP–Trailer Park
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- OBSERVATION OR LOOKOUT TOWER
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- FISH HATCHERY
- GOLF COURSE OR COUNTRY CLUB
- ATHLETIC FIELD OR AMUSEMENT PARK
- FAIRGROUNDS, RACE COURSE
- DWELLING
- NUMBER OF DWELLINGS CLOSELY SPACED
- COMBINED BUSINESS AND DWELLING
- POST OFFICE
- POST OFFICE COMBINATIONS

- ELEVATION ABOVE SEA LEVEL
- MOUNTAIN RANGE, BUTTE OR MESA
- SMALL MONUMENT
- MARSH OR SWAMP LANDS
- DRAINAGE DITCH
- IRRIGATION DITCH
- LAKE, RESERVOIR OR POND WITH DAM
- ROAD OVER DAM
- DRY LAKE SUBJECT TO FLOOD
- SMALL BRIDGES CLOSELY SPACED
- HIGHWAY BRIDGE, OVER 20FT. IN LENGTH
- GENERAL BRIDGE, LONG CROSSING
- ARCH BRIDGE
- TRUSS BRIDGE,W–WOOD,S–STEEL,C–CONCRETE
- CONCRETE DIP OR FORD
- FORD ROAD ESTABLISHED
- INTERMITTENT STREAM
- NARROW STREAM
- DOCK PIER OR LANDING
- NAVIGABLE STREAM WITH LOCK & DAM
- WIDE STREAM OR RIVER
- TRIANGULATION STATION

- SEASONAL DWELLINGS
- CHURCH OR OTHER RELIGIOUS BUILDING
- CEMETERY
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- SAW MILL
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- WAREHOUSE
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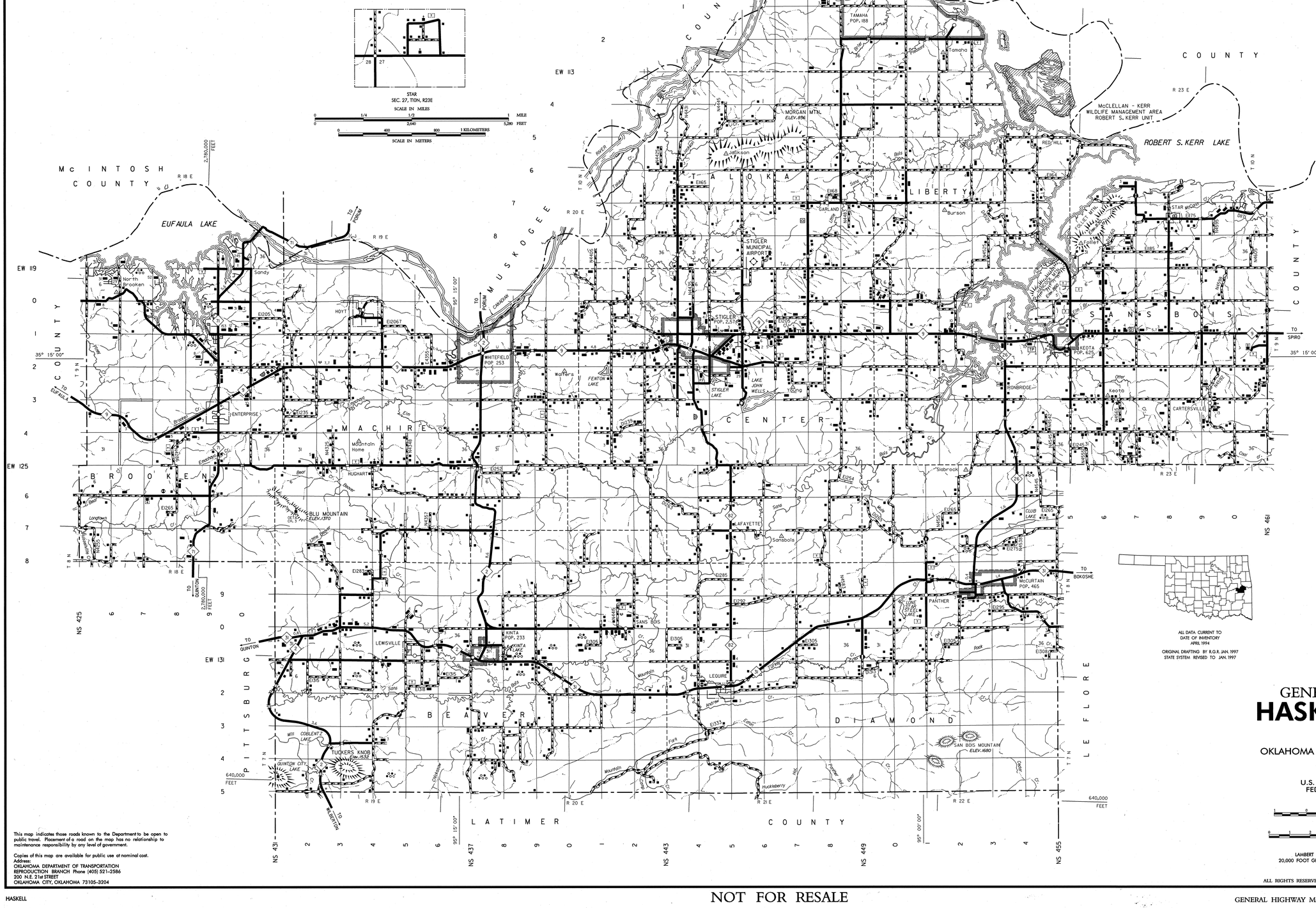
- MILITARY INSTALLATION




STAR
SEC. 27, T10N, R23E
SCALE IN MILES
0 1/4 1/2 1 MILE
0 2,640 5,280 FEET
SCALE IN METERS
0 400 800 1 KILOMETERS

LEQUIRE
SEC. 5, T7N, R21E
SCALE IN MILES
0 1/4 1/2 1 MILE
0 2,640 5,280 FEET
SCALE IN METERS
0 400 800 1 KILOMETERS

LEWISVILLE
SEC. 35, T8N, R19E
SCALE IN MILES
0 1/4 1/2 1 MILE
0 2,640 5,280 FEET
SCALE IN METERS
0 400 800 1 KILOMETERS

ENTERPRISE
SEC. 26,27 T8N, R19E
SCALE IN MILES
0 1/4 1/2 1 MILE
0 2,640 5,280 FEET
SCALE IN METERS
0 400 800 1 KILOMETERS

HOYT
SEC. 9, T9N, R19E
SCALE IN MILES
0 1/4 1/2 1 MILE
0 2,640 5,280 FEET
SCALE IN METERS
0 400 800 1 KILOMETERS

ALL DATA CURRENT TO DATE OF INVENTORY APRIL 1994

ORIGINAL DRAFTING BY R.G.R. JAN. 1997
STATE SYSTEM REVISED TO JAN. 1997

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# GENERAL HIGHWAY MAP
# HASKELL COUNTY
## OKLAHOMA

PREPARED BY THE
OKLAHOMA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION

IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE IN MILES
0 1 2 3 4 5 MILES
0 1 2 3 4 5 6 7 8 9 10 KILOMETERS
SCALE IN KILOMETERS

LAMBERT CONFORMAL CONIC PROJECTION U.S. & GEODETIC SURVEY DATA
20,000 FOOT GRID; OKLAHOMA PLANE COORDINATE SYSTEM, SOUTH PROJECTION ZONE.
POPULATION FIGURES BASED ON 1990 U.S. CENSUS
CO. POP. 10,940

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# GENERAL HIGHWAY MAP
# HUGHES COUNTY
## OKLAHOMA

PREPARED BY THE
OKLAHOMA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION

IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

ATWOOD
SEC. 27 & 34, T 6 N, R 9 E
SCALE IN MILES
SCALE IN METERS

SCALE IN MILES
SCALE IN KILOMETERS

ALL DATA CURRENT TO
DATE OF INVENTORY
APRIL 1995

ORIGINAL DRAFTING BY F.O.B. JAN 1996
CASES SYSTEMS REVISED TO MARCH 1996

LAMBERT CONFORMAL CONIC PROJECTION U.S. & GEODETIC SURVEY DATA
20,000 FOOT GRID, OKLAHOMA PLANE COORDINATE SYSTEM, SOUTH ZONE.
POPULATION FIGURES BASED ON 1990 U.S. CENSUS
CO-OP 1/2/95

## LEGEND

- RAILROAD, ANY NUMBER OF TRACKS
- RAILROAD, SINGLE TRACK & ABANDONED
- GRADE CROSSING
- UNDERPASS, R.R. ABOVE
- OVERPASS, R.R. BELOW
- RAILROAD ON STREET
- TUNNEL
- AIRPORT WITH COMPLETE FACILITIES
- AIRPORT WITH LIMITED FACILITIES
- AIRPORT WITH PRIVATE FIELD
- AIRPORT, GENERAL OUTLINE OF FIELD AND RUNWAYS IN APPROX. POSITION
- ROADSIDE PARK, Pres. Grounds
- PLAYGROUNDS
- SWIMMING POOL OR SWIMMING POOL SITE
- SCENIC SITE
- MOTEL OR LODGE, Permanent with buildings
- SMALL PARK, City-County
- LARGE PARK, State or Federal or Indian Park
- FOREST RANGER STATION
- OBSERVATION OR LOOKOUT TOWER
- FISH HATCHERY
- GOLF COURSE OR COUNTRY CLUB
- ATHLETIC FIELD OR AMUSEMENT PARK
- FAIRGROUNDS, RACE COURSE
- CEMETERY
- NUMBER OF DWELLINGS CLOSELY SPACED
- POST OFFICE, BUSINESS AND DWELLING
- POST OFFICE COMBINATIONS
- SEASONAL DWELLINGS
- CHURCH OR OTHER RELIGIOUS BUILDING
- CHURCH WITH CEMETERY ADJACENT
- CEMETERY
- HOSPITAL
- SCHOOL
- SMALL BUSINESS
- INDUSTRY
- MINE OR QUARRY
- MINE SHAFT OR DRIFT
- OIL OR GAS WELL
- GAUGING OR PUMPING STATION
- GRAVEL PIT
- QUARRY
- MILL
- COMMUNITY HALL OR LODGE
- DRIVE-IN THEATER
- OTHER PUBLIC INSTITUTION
- HIGHWAY GARAGE
- AUTO SERVICE FACILITIES (Repairs, Automobile, Bi-Cross Building Material, Equipment, Fuel & Oil, Tire & Battery, Fly Ca-Ca-Ca)
- WATER SUPPLY STAND PIPE
- WATER TOWER
- SEWAGE DISPOSAL PLANT
- BOOSTER STATION
- FIRE LOOKOUT STATION
- TELEVISION OR RADIO STATION
- MILITARY INSTALLATION
- ELEVATION ABOVE SEA LEVEL
- LOCATION RANGE, BUTTE OR MESA
- SMALL MOUNTAIN
- MARSH OR SWAMP LANDS
- DRAINAGE DITCH
- INTERMITTENT STREAM
- LAKE, RESERVOIR OR POND WITH DAM
- ROAD OVER DAM
- DRY LAKE SUBJECT TO FLOOD
- FORD ROAD ACROSS STREAM
- HIGHWAY BRIDGE, OVER 20FT. IN LENGTH
- GENERAL BRIDGE, LONG CROSSING
- TUNNEL
- TRUSS BRIDGE, M=WOOD, S=STEEL, C=CONCRETE
- CONCRETE DIP OR FORD
- FORD ROAD ESTABLISHED
- FORD ROAD IMPROVED
- NARROW STREAM
- DOCK OR LANDING
- NAVIGABLE STREAM WITH LOCK & DAM
- WIDE STREAM OR RIVER
- TRIANGULATION STATION
- U.S. NUMBERED HIGHWAY
- STATE NUMBERED HIGHWAY
- INTERSTATE HIGHWAY ROUTE
- PAVED ROAD
- GRAVEL ROAD
- IMPROVED UNPAVED ROAD
- UNIMPROVED ROAD
- PROJECTED ROAD
- COUNTY ROAD "E" NO.
- MILEAGE BETWEEN POINTS
- DIVIDED HIGHWAY, 4 OR MORE LANES
- UNDIVIDED HIGHWAY, 3 OR MORE LANES
- TRAFFIC CIRCLE
- GRADE SEPARATION
- TRAFFIC INTERCHANGE
- STATE LINE
- CIVIL TOWNSHIP LINE
- CORPORATE LIMITS
- RURAL DEVELOPMENT AREA
- GOVERNMENT PROPERTY LINE
- COUNTY SEAT
- COUNTY LINE
- CORPORATE LIMITS
- CIVIL TOWNSHIP, ROAD IN FACE
- INSET BOUNDARY

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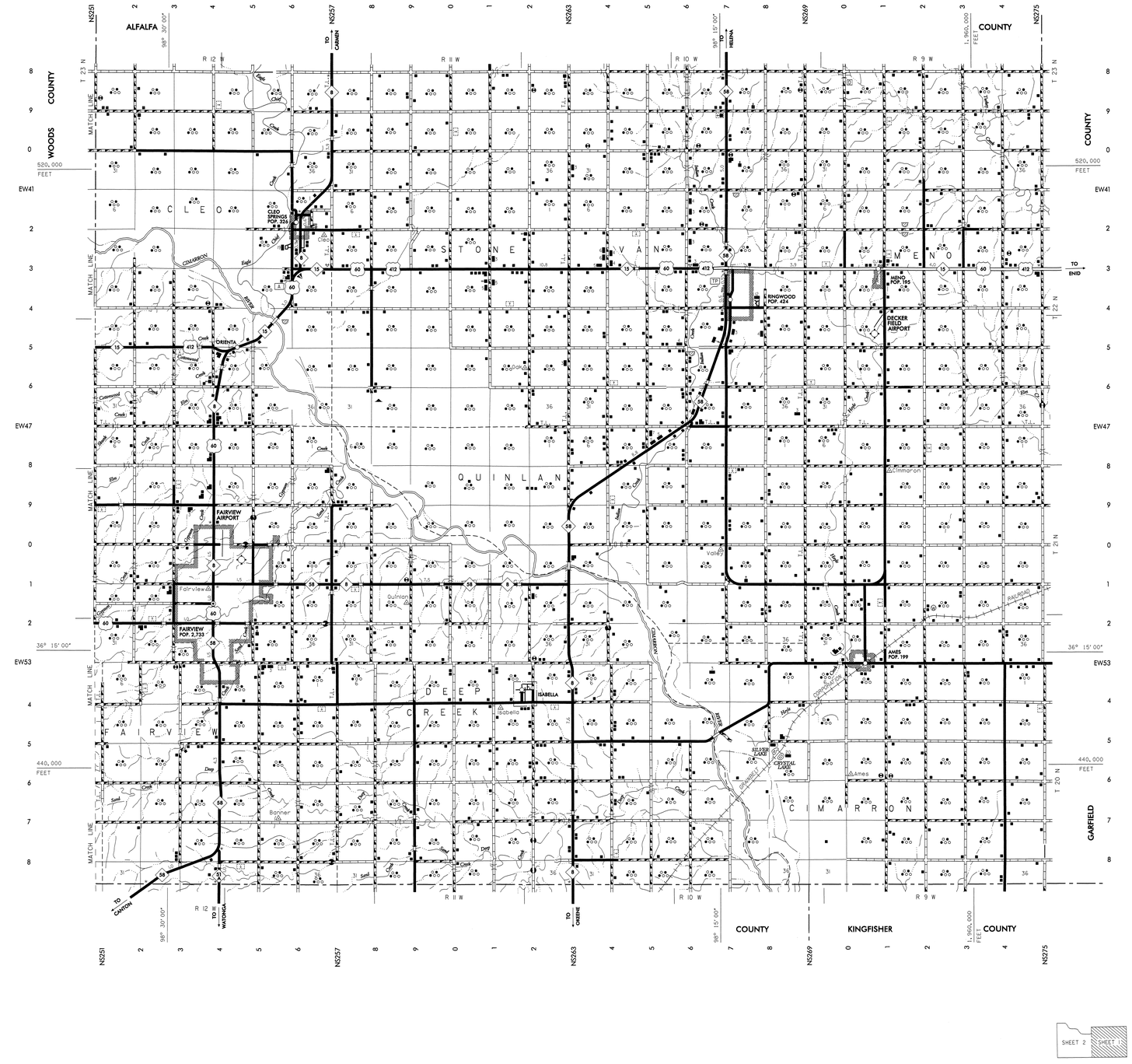


## LEGEND

- U.S.NUMBERED HIGHWAY
- STATE NUMBERED HIGHWAY
- INTERSTATE HIGHWAY ROUTE
- PAVED ROAD
- GRAVEL ROAD
- GRADED & DRAINED ROAD
- UNIMPROVED ROAD
- PRIMITIVE ROAD
- PROJECTED ROAD
- RESIDENTIAL ROAD
- N0001 COUNTY ROAD ID NO.
- MILEAGE BETWEEN POINTS
- DIVIDED HIGHWAY 4 OR MORE LANES
- UNDIVIDED HIGHWAY, 3 OR MORE LANES
- TRAFFIC CIRCLE
- HIGHWAY GRADE SEPARATION
- TRAFFIC INTERCHANGE
- STATE LINE
- COUNTY LINE
- CIVIL TOWNSHIP LINE
- SECTION LINE
- RURAL DEVELOPMENT AREA
- GOVERNMENT PROPERTY LINE
- MATCH LINE
- COUNTY SEAT
- TOWN CENTER
- CORPORATE LIMITS
- CIVIL TOWNSHIP, ROAD IN PLACE
- INSET BOUNDARY
- ELEVATION ABOVE SEA LEVEL
- MOUNTAIN RANGE, BUTTE OR MESA
- SMALL MONUMENT
- MARSH OR SWAMP LANDS
- DRAINAGE DITCH
- IRRIGATION DITCH
- LAKE, RESERVOIR OR POND WITH DAM
- ROAD OVER DAM
- DRY LAKE SUBJECT TO FLOOD
- SMALL BRIDGES CLOSELY SPACED
- HIGHWAY BRIDGE, OVER 20FT. IN LENGTH
- GENERAL BRIDGE, LONG CROSSING
- ARCH BRIDGE
- TRUSS BRIDGE,W-WOOD,S-STEEL,C-CONCRETE
- CONCRETE DIP OR FORD
- FORD ROAD ESTABLISHED
- INTERMITTENT STREAM
- NARROW STREAM
- DOCK PIER OR LANDING
- NAVIGABLE STREAM WITH LOCK & DAM
- WIDE STREAM OR RIVER
- TRIANGULATION STATION
- RAILROAD, ANY NUMBER OF TRACKS
- RAILROAD WITH STATION INDICATED
- GRADE CROSSING
- UNDERPASS, R.R. ABOVE
- OVERPASS, R.R. BELOW
- RAILROAD ON STREET
- MILITARY AIRFIELD
- AIRPORT WITH COMPLETE FACILITIES
- AIRPORT WITH LIMITED FACILITIES
- LANDING STRIP, PRIVATE FIELD
- AIRPORT, GENERAL OUTLINE OF FIELD RUNWAYS SHOWN IN POSITION
- ROADSIDE PARK Picnic Grounds PLAYGROUNDS
- BATHING BEACH OR SWIMMING POOL
- SCENIC SITE
- MOTEL
- CAMP OR LODGE, Permanent with buildings SP-State, CP-County
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- POST OFFICE COMBINATIONS
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- CHURCH WITH CEMETERY ADJACENT
- REST HOME
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- WAREHOUSE
- GRAVEL PIT
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- DRIVE-IN THEATER
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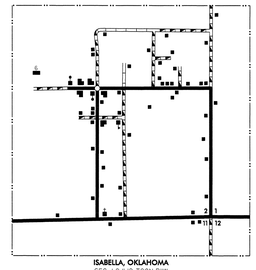
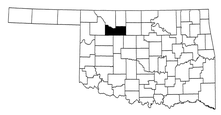
- SEWAGE DISPOSAL PLANT
- WATER SUPPLY STAND PIPE
- POWER PLANT
- BOOSTER STATION
- POWER SUBSTATION
- KOMA TELEVISION OR RADIO STATION
- MILITARY INSTALLATION



ALL DATA CURRENT TO DATE OF INVENTORY FEBRUARY, 2000

ORIGINAL DRAFTING BY W.A.T. JANUARY, 2002
STATE SYSTEM REVISED TO JANUARY, 2002

SHEET 1OF 2 SHEETS

N

# GENERAL HIGHWAY MAP
# MAJOR COUNTY
## OKLAHOMA

PREPARED BY THE
OKLAHOMA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION

IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE IN MILES
1 0 1 2 3 4 5 6 MILES
0 1 2 3 4 5 6 7 8 9 10 KILOMETERS
SCALE IN KILOMETERS

LAMBERT CONFORMAL CONIC PROJECTION U.S. & GEODETIC SURVEY DATA
20,000 FOOT GRID; OKLAHOMA PLANE COORDINATE SYSTEM, NORTH PROJECTION ZONE.
POPULATION FIGURES BASED ON 2000 U.S. CENSUS
CO. POP. 7,545

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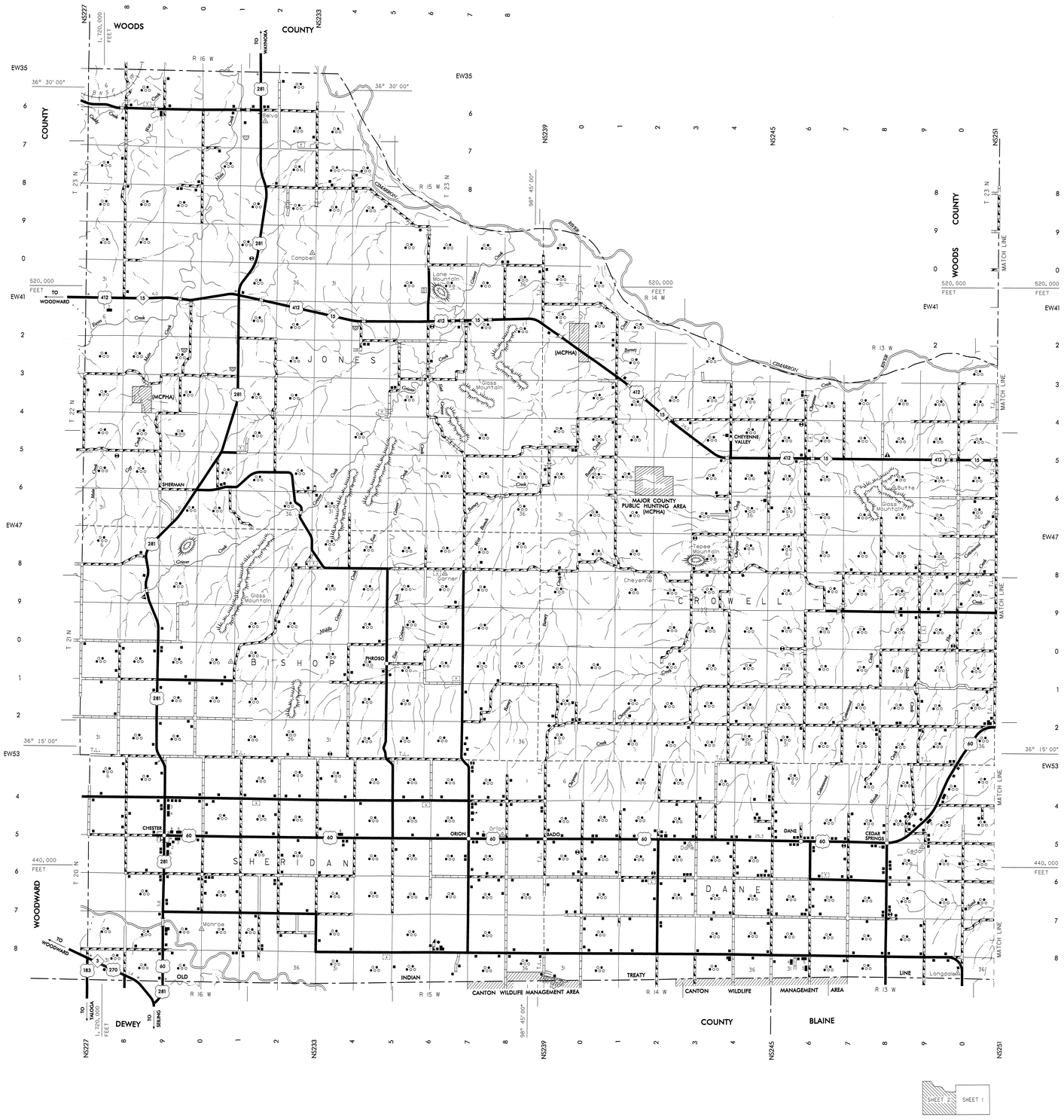


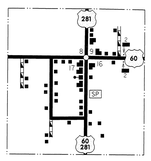


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SHEET 2 OF 2 SHEETS

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## LEGEND

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- UNIMPROVED ROAD
- PRIMITIVE ROAD
- PROJECTED ROAD
- RESIDENTIAL ROAD
- N0001 COUNTY ROAD ID NO.
- 0.3 0.7 MILEAGE BETWEEN POINTS
- DIVIDED HIGHWAY, 4 OR MORE LANES
- UNDIVIDED HIGHWAY, 3 OR MORE LANES
- TRAFFIC CIRCLE
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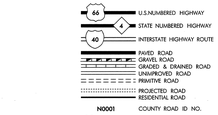

ALL DATA CURRENT TO DATE OF INVENTORY NOVEMBER 1999

ORIGINAL DRAFTING BY M.L.B. MAY 2000
STATE SYSTEM REVISED TO NOVEMBER 1999

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SCALE IN MILES 0 1/8 1/4 1/2 MILE; 0 1,320 2,640 FEET
SCALE IN METERS 0 200 400 600 800 1 KILOMETER

ONAPA, OKLAHOMA
SEC. 19, 30, T1IN, R17E

VERNON, OKLAHOMA
SEC 33, 34, T9 N, R13E

# GENERAL HIGHWAY MAP
# McINTOSH COUNTY
## OKLAHOMA

PREPARED BY THE
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PLANNING DIVISION

IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE IN MILES 0 1 2 3 4 5 MILES
SCALE IN KILOMETERS 0 1 2 3 4 5 6 7 8 9 10 KILOMETERS

LAMBERT CONFORMAL CONIC PROJECTION U.S. & GEODETIC SURVEY DATA
20,000 FOOT GRID; OKLAHOMA PLANE COORDINATE SYSTEM. NORTH PROJECTION ZONE.
POPULATION FIGURES BASED ON 1990 U.S. CENSUS
CO. POP. 16,779

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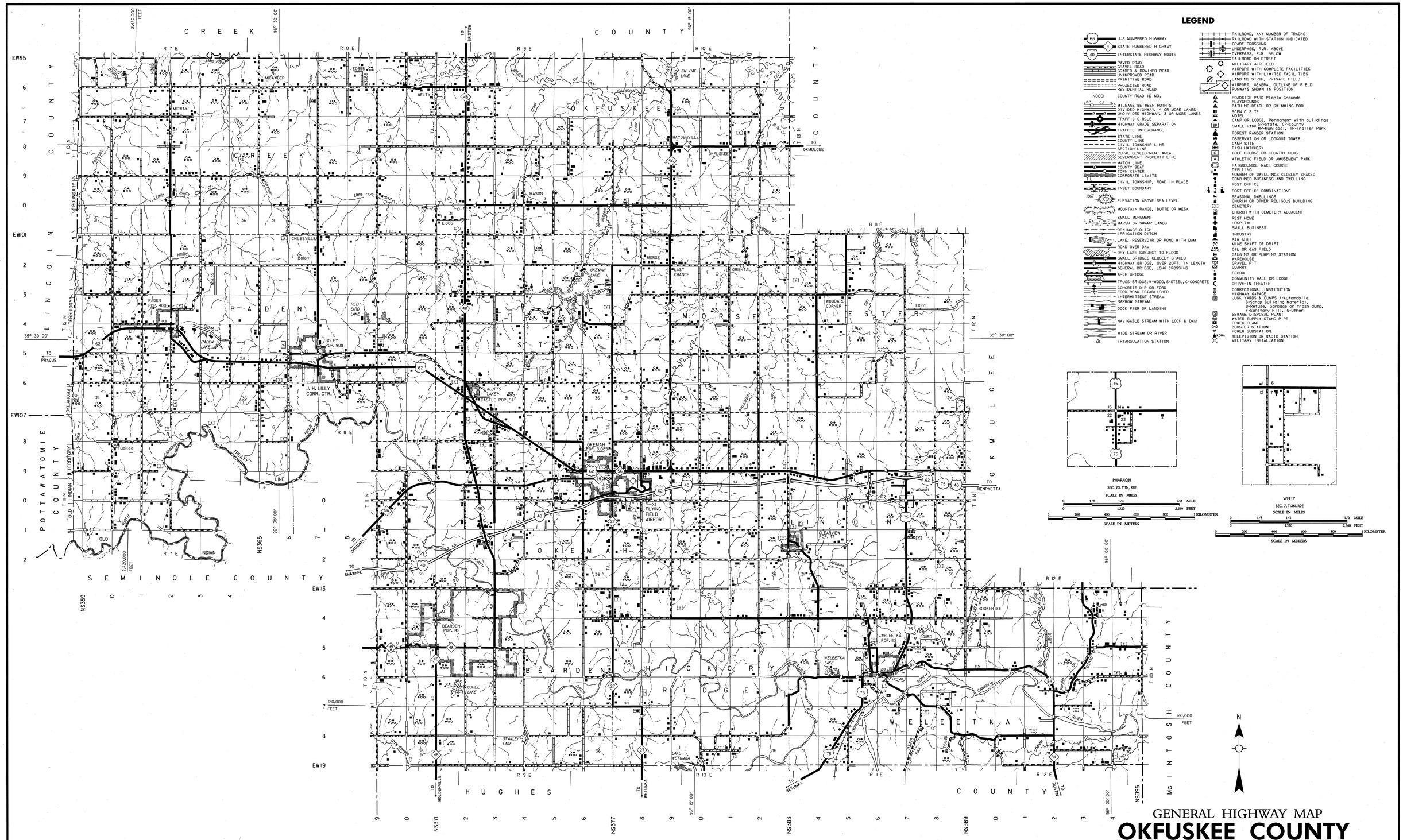


## LEGEND

- U.S.NUMBERED HIGHWAY
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- INTERSTATE HIGHWAY ROUTE
- PAVED ROAD
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- WATER SUPPLY STAND PIPE
- POWER PLANT
- BOOSTER STATION
- POWER SUBSTATION
- TELEVISION OR RADIO STATION
- MILITARY INSTALLATION




PHARAOH
SEC. 23, T11N, R7E
SCALE IN MILES
0 1/8 1/4 1/2 MILE
0 1,320 2,640 FEET
0 200 400 600 800 1 KILOMETER
SCALE IN METERS




WELTY
SEC. 7, T13N, R9E
SCALE IN MILES
0 1/8 1/4 1/2 MILE
0 1,320 2,640 FEET
0 200 400 600 800 1 KILOMETER
SCALE IN METERS



ALL DATA CURRENT TO DATE OF INVENTORY NOV. 1990

ORIGINAL DRAFTING BY R.G.R. JULY 1995
STATE SYSTEM REVISED TO JAN. 1997

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200 N.E. 21st STREET
OKLAHOMA CITY, OKLAHOMA 73105-3204

This map indicates those roads known to the Department to be open to public travel. Placement of a road on the map has no relationship to maintenance responsibility by any level of government.

# GENERAL HIGHWAY MAP
# OKFUSKEE COUNTY
## OKLAHOMA

PREPARED BY THE
OKLAHOMA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION

IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE IN MILES
0 1 2 3 4 5 MILES
0 1 2 3 4 5 6 7 8 9 10 KILOMETERS
SCALE IN KILOMETERS

LAMBERT CONFORMAL CONIC PROJECTION U.S. & GEODETIC SURVEY DATA
20,000 FOOT GRID; OKLAHOMA PLANE COORDINATE SYSTEM NORTH PROJECTION ZONE.
POPULATION FIGURES BASED ON 1990 U.S. CENSUS
CO. POP. 11,551

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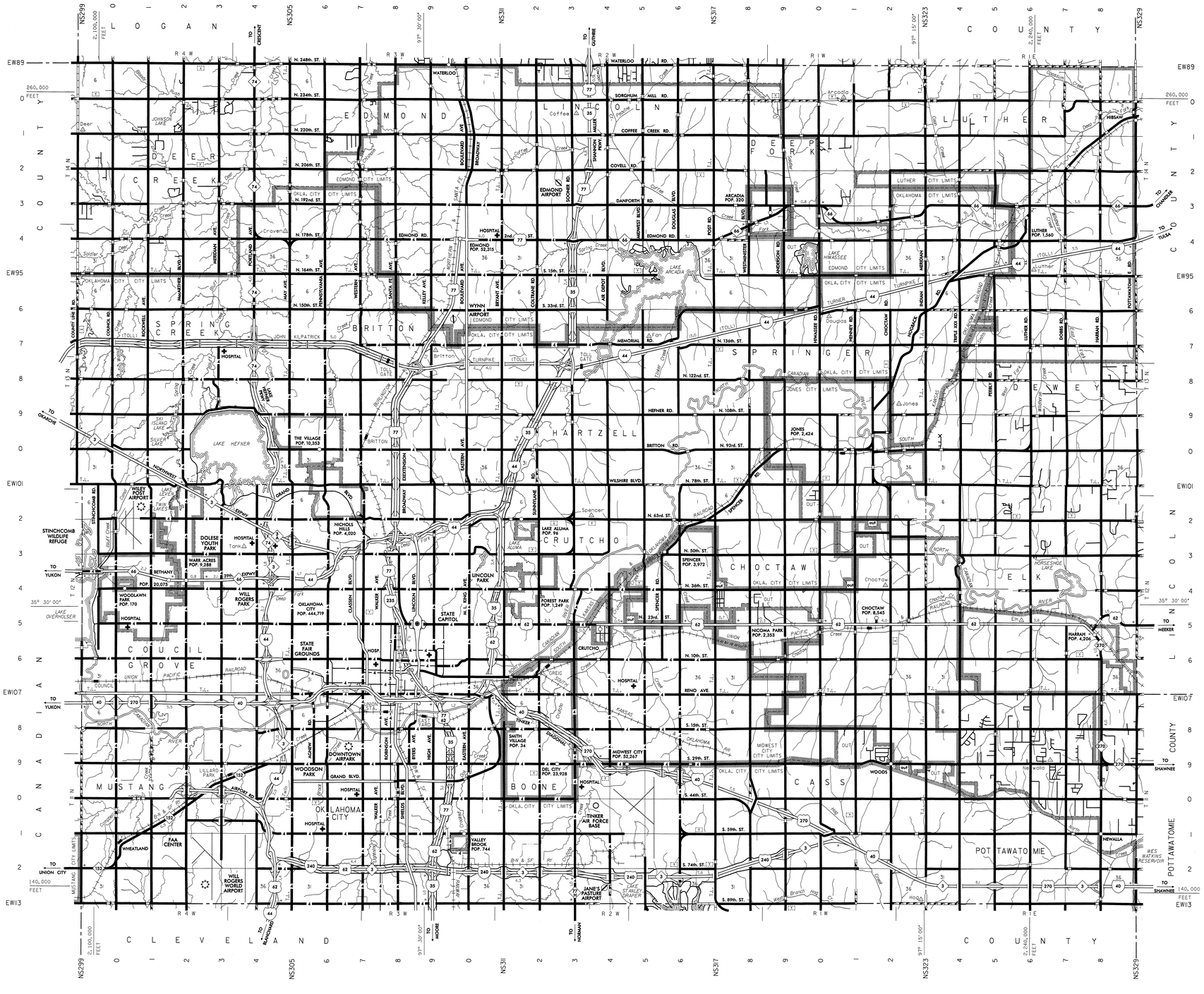


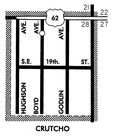


CRUTCHO
SEC. 28, T12N, R2W

SCALE IN MILES
0 1/4 1/2 1 MILE
0 2,640 5,280 FEET
0 400 800 1 KILOMETER
SCALE IN METERS

## LEGEND

- U.S.NUMBERED HIGHWAY
- STATE NUMBERED HIGHWAY
- INTERSTATE HIGHWAY ROUTE
- PAVED ROAD
- GRAVEL ROAD
- GRADED & DRAINED ROAD
- UNIMPROVED ROAD
- PRIMITIVE ROAD
- PROJECTED ROAD
- RESIDENTIAL ROAD
- N0001 COUNTY ROAD ID NO.
- MILEAGE BETWEEN POINTS
- DIVIDED HIGHWAY, 4 OR MORE LANES
- UNDIVIDED HIGHWAY, 3 OR MORE LANES
- TRAFFIC CIRCLE
- HIGHWAY GRADE SEPARATION
- TRAFFIC INTERCHANGE
- STATE LINE
- COUNTY LINE
- CIVIL TOWNSHIP LINE
- SECTION LINE
- RURAL DEVELOPMENT AREA
- GOVERNMENT PROPERTY LINE
- MATCH LINE
- COUNTY SEAT
- TOWN CENTER
- CORPORATE LIMITS
- CIVIL TOWNSHIP, ROAD IN PLACE
- INSET BOUNDARY
- 1867 ELEVATION ABOVE SEA LEVEL
- MOUNTAIN RANGE, BUTTE OR MESA
- SMALL MONUMENT
- MARSH OR SWAMP LANDS
- DRAINAGE DITCH
- IRRIGATION DITCH
- LAKE, RESERVOIR OR POND WITH DAM
- ROAD OVER DAM
- DRY LAKE SUBJECT TO FLOOD
- SMALL BRIDGES CLOSELY SPACED
- HIGHWAY BRIDGE, OVER 20FT. IN LENGTH
- GENERAL BRIDGE, LONG CROSSING
- ARCH BRIDGE
- TRUSS BRIDGE,W-WOOD,S-STEEL,C-CONCRETE
- CONCRETE DIP OR FORD
- FORD ROAD ESTABLISHED
- INTERMITTENT STREAM
- NARROW STREAM
- DOCK PIER OR LANDING
- NAVIGABLE STREAM WITH LOCK & DAM
- WIDE STREAM OR RIVER
- TRIANGULATION STATION
- RAILROAD, ANY NUMBER OF TRACKS
- RAILROAD WITH STATION INDICATED
- GRADE CROSSING
- UNDERPASS, R.R. ABOVE
- OVERPASS, R.R. BELOW
- RAILROAD ON STREET
- MILITARY AIRFIELD
- AIRPORT WITH COMPLETE FACILITIES
- AIRPORT WITH LIMITED FACILITIES
- LANDING STRIP, PRIVATE FIELD
- AIRPORT, GENERAL OUTLINE OF FIELD
- RUNWAYS SHOWN IN POSITION
- ROADSIDE PARK Picnic Grounds
- PLAYGROUNDS
- BATHING BEACH OR SWIMMING POOL
- SCENIC SITE
- MOTEL
- CAMP OR LODGE, Permanent with buildings
- SP-State, CP-County
- SMALL PARK MP-Municipal, TP-Trailer Park
- FOREST RANGER STATION
- OBSERVATION OR LOOKOUT TOWER
- CAMP SITE
- FISH HATCHERY
- GOLF COURSE OR COUNTRY CLUB
- ATHLETIC FIELD OR AMUSEMENT PARK
- FAIRGROUNDS, RACE COURSE
- DWELLING
- NUMBER OF DWELLINGS CLOSELY SPACED
- COMBINED BUSINESS AND DWELLING
- POST OFFICE
- POST OFFICE COMBINATIONS
- SEASONAL DWELLINGS
- CHURCH OR OTHER RELIGOUS BUILDING
- CEMETERY
- CHURCH WITH CEMETERY ADJACENT
- REST HOME
- HOSPITAL
- SMALL BUSINESS
- INDUSTRY
- SAW MILL
- MINE SHAFT OR DRIFT
- OIL OR GAS FIELD
- GAUGING OR PUMPING STATION
- WAREHOUSE
- GRAVEL PIT
- QUARRY
- SCHOOL
- COMMUNITY HALL OR LODGE
- DRIVE-IN THEATER
- CORRECTIONAL INSTITUTION
- HIGHWAY GARAGE
- JUNK YARDS & DUMPS A-Automobile, B-Scrap Building Material, D-Refuse, Garbage or trash dump, F-Sanitary Fill, G-Other
- SEWAGE DISPOSAL PLANT
- WATER SUPPLY STAND PIPE
- POWER PLANT
- BOOSTER STATION
- POWER SUBSTATION
- KOMA TELEVISION OR RADIO STATION
- MILITARY INSTALLATION

N

# GENERAL HIGHWAY MAP
# OKLAHOMA COUNTY
## OKLAHOMA

PREPARED BY THE
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PLANNING DIVISION

IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE IN MILES
1 0 1 2 3 4 5 MILES
6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 10 KILOMETERS
SCALE IN KILOMETERS

OKLAHOMA CITY POP. 444,719
IN OKLAHOMA CO. POP. 391,137
IN CANADIAN CO. POP. 18,716
IN CLEVELAND CO. POP. 17,295
IN McCLAIN CO. POP. 109
IN POTTAWATOMIE CO. POP. 64

ALL DATA CURRENT TO
DATE OF INVENTORY
JANUARY 1995

ORIGINAL DRAFTING BY W.A.T. APRIL 1999
STATE SYSTEM REVISED TO APRIL 1999

LAMBERT CONFORMAL CONIC PROJECTION U.S. & GEODETIC SURVEY DATA
20,000 FOOT GRID; OKLAHOMA PLANE COORDINATE SYSTEM NORTH PROJECTION ZONE.
POPULATION FIGURES BASED ON 1990 U.S. CENSUS
CO. POP. 599,611

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Address:
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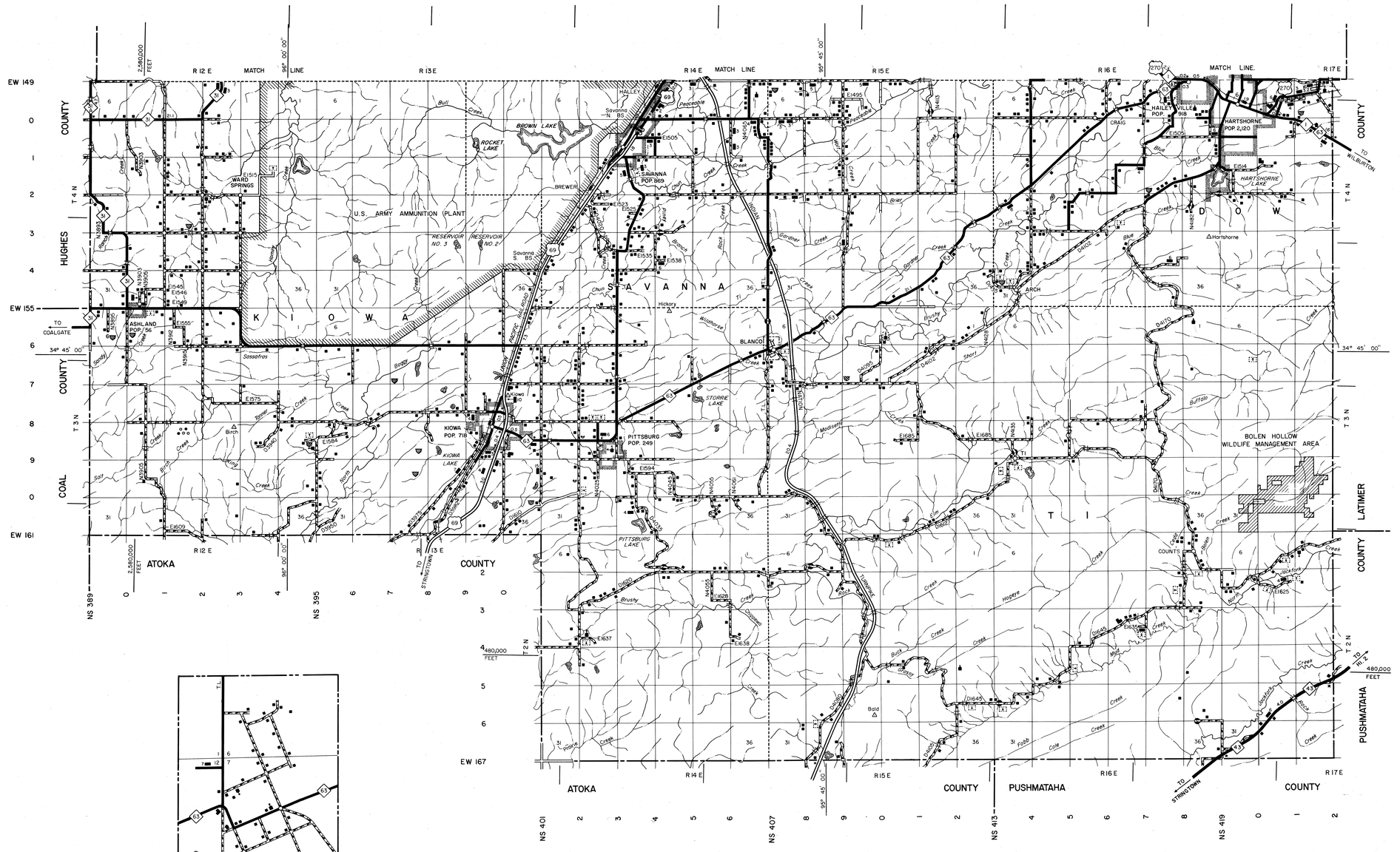
NOT FOR RESALE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R 13 E
R 14 E
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R 16 E
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R 17 E
2,580,000 FEET
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95° 45' 00"
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EW 155
EW 161
EW 167
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34° 45' 00"
4,480,000 FEET
HUGHES COUNTY
COAL COUNTY
ATOKA COUNTY
PUSHMATAHA COUNTY
LATIMER COUNTY
K I O W A
S A V A N N A
U.S. ARMY AMMUNITION PLANT
"RESERVOIR NO. 3"
"RESERVOIR NO. 2"
ROCKET LAKE
BROWN LAKE
HALLEY
Savanna N BS
Savanna S BS
SAVANNA POP. 969
BREWER
HAILEYVILLE POP. 918
CRAIG
HARTSHORNE POP. 2,120
HARTSHORNE LAKE
Hartshorne
ARCH
WARD SPRINGS
ASHLAND POP. 56
TO COALGATE
BLANCO
KIOWA POP. 718
KIOWA LAKE
PITTSBURG POP. 249
PITTSBURG LAKE
STORRIE LAKE
BOLEN HOLLOW WILDLIFE MANAGEMENT AREA
TO WILBURTON
TO STRINGTOWN
Bull Creek
Peaceable Creek
Gardner Creek
Rock Creek
Blue Creek
Daize Creek
Wildhorse Creek
Sassafras Creek
Brushy Creek
Short Creek
Buffalo Creek
Hickory Creek
Prairie Creek
Bald Creek
Cole Creek
Honey Creek
Mud Creek
Salt Creek
Birch Creek
Spring Creek
Indian Creek
Muddy Creek
Big Creek
Little Creek
Dry Creek
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Fork
Middle Fork
South Fork
Pacific Railroad
Kiowa
Stringtown
Atoka
Pittsburg
Blanco
Wilburton
Hartshorne
Haileyville
Savanna
Arch
Craig
Ashland
Ward Springs
Brewer
Rocket Lake
Brown Lake
Kiowa Lake
Pittsburg Lake
Storrie Lake
Hickory
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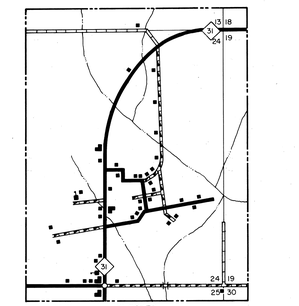
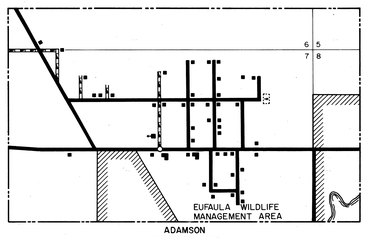
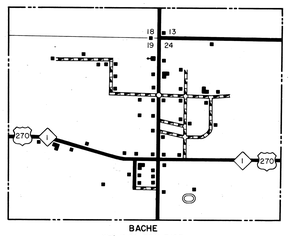
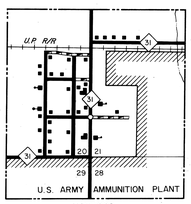
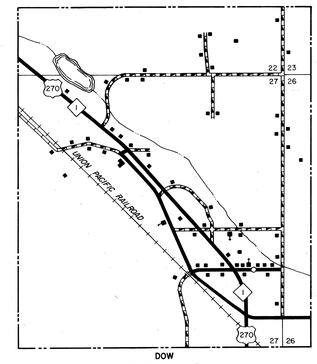
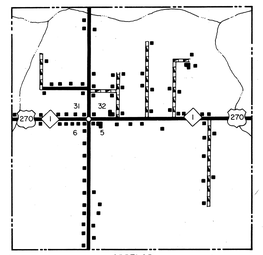



Copies of this map are available for public use at nominal cost.
Address: OKLAHOMA DEPARTMENT OF TRANSPORTATION
REPRODUCTION BRANCH Phone (405) 521-2586
200 N.E. 21 st. STREET
OKLAHOMA CITY, OKLAHOMA 73105

This map indicates those roads known to the Department to be open to public travel. Placement of a road on the map has no relationship to maintenance responsibility by any level of government.

SHEET 2 OF 2 SHEETS



**NOT FOR RESALE**

# GENERAL HIGHWAY MAP
# POTTAWATOMIE COUNTY
## OKLAHOMA

PREPARED BY THE
OKLAHOMA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION

IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

ALL DATA CURRENT TO
DATE OF THIS REPORT
JUNE 1994

ORIGINAL DRAFTING BY WT AUG. 1994
STATE SYSTEM REVISED TO JAN. 1995

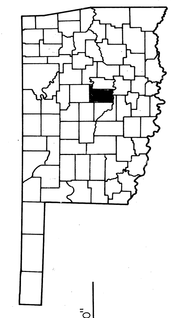
PLEASE NOTE: CHANGE AT STATE HIGHWAY 9
SEVERAL NORTH & SOUTH COUNTY ROAD NAMES CHANGE AT U.S. HIGHWAY 177
SEVERAL EAST & WEST COUNTY ROAD NAMES CHANGE AT U.S. HIGHWAY 177

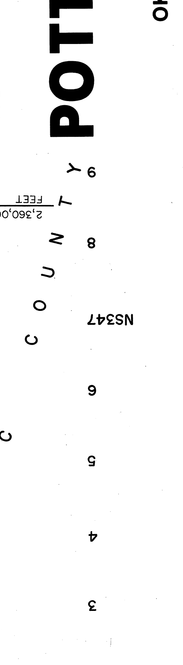
SCALE
0 1 2 3 4 MILES

DALE
SEC. 25,26,T11N,R2E
SCALE
0 0.1 0.2 0.3 0.4 0.5 MILE
0 660 1,320 2,640 FEET

## LEGEND

U.S. NUMBERED HIGHWAY
STATE NUMBERED HIGHWAY
INTERSTATE HIGHWAY ROUTE
PAVED ROAD
GRAVEL ROAD, PLANNED ROAD
UNIMPROVED ROAD
PROPOSED ROAD
PROJECTED ROAD
RESIDENTIAL ROAD
COUNTY ROAD ID NO.
DIVIDED HIGHWAY, 4 OR MORE LANES
UNDIVIDED HIGHWAY, 3 OR MORE LANES
TOLL ROAD
HIGHWAY GRADE SEPARATION
TRAFFIC INTERCHANGE
STATE LINE
COUNTY LINE
CONGRESSIONAL TOWNSHIP LINE
SECTION LINE
INDIAN RESERVATION BDRY.
GOVERNMENT PROPERTY LINE
MATCH LINE
INSET BOUNDARY
TOWN CENTER
CORPORATE LIMITS
CIVIL TOWNSHIP, ROAD IN PLACE
INSET BOUNDARY
ELEVATION ABOVE SEA LEVEL
MOUNTAIN RANGE, BUTTE OR MESA
MARSH OR SWAMP LANDS
DRAINAGE DITCH
LAKE, RESERVOIR OR POND WITH DAM
ROAD OVER DAM
DRY LAKE SUBJECT TO FLOOD
SMALL BRIDGE, LESS 20 FT. IN LENGTH
GENERAL BRIDGE, LONG CROSSING
ARCH BRIDGE
TRUSS BRIDGE, IN WOOD, S-Steel, C-Concrete
FORD ROAD ESTABLISHED
FORD ROAD NOT ESTABLISHED
NARROW STREAM
DOCK PIER OR LANDING
NAVIGABLE STREAM WITH LOCK & DAM
WIDE STREAM OR RIVER
TRIANGULATION STATION
RAILROAD, ANY NUMBER OF TRACKS
RAILROAD, TRACKS NOT SHOWN
GRADE CROSSING
OVERPASS, R.R. ABOVE
OVERPASS, R.R. BELOW
RAILROAD SIDING
MILITARY AIRFIELD
AIRPORT WITH PAVED RUNWAYS & ITS FACILITIES
AIRPORT WITH UNPAVED RUNWAYS & ITS FACILITIES
LANDING STRIP, PRIVATE FIELD
LANDING STRIP, ABANDONED OR UNUSABLE FIELD
RUNWAYS SHOWN IN POSITION
ROADSIDE PARK Picnic Grounds
PLAYGROUND
SWIMMING POOL OR SWIMMING POOL
HOTEL, MOTEL
SCENIC SITE
CAMP OR LODGE, Permanent With Buildings
CAMP OR LODGE, Other Than Permanent
SMALL PARK, MP-Municipal, TP-Trailer Park
FOREST FIRE LOOKOUT TOWER
FOREST RANGER STATION
CAMP SITE
CAMP OR RECERY
GOLF COURSE OR COUNTRY CLUB
ATHLETIC FIELD OR AMUSEMENT PARK
CEMETERY, PACE COURSE
DWELLING
NUMBER OF DWELLINGS CLOSELY SPACED
SCHOOL, HOSPITAL, INDUSTRIAL
POST OFFICE
POST OFFICE COMBINATIONS
CHURCH OR OTHER RELIGIOUS BUILDING
CEMETERY
CHURCH WITH CEMETERY ADJACENT
REST HOME
HOSPITAL
INDUSTRIAL BUILDINGS
INDUSTRY
SAW MILL
GRAIN ELEVATOR OR DRIFT
OIL OR GAS FIELD
GAUGING OR PUMPING STATION
GRAVEL PIT
QUARRY
SCHOOL
COMMUNITY HALL OR LODGE
DRIVE-IN THEATER
PUBLIC BUILDING OR INSTITUTION
HIGHWAY GARAGE
JUNK YARD, Scrap Metal, Automobile, Bi-Stone Building Material
SERVICE STATION, Auto Repair, Trailer Dump
F-Stanley Fifa, G-Other
WATER SUPPLY STAND PIPE
WATER TOWER
BOOSTER STATION
TELEPHONE OR RADIO STATION
TELEVISION OR RADIO STATION
MILITARY INSTALLATION






OKFUSKEE COUNTY
T11N
760,000 FEET
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R4E
R3E
R2E
NS353
NS347
NS341
NS335
NS329
2,360,000 FEET
2,260,000 FEET
96° 45' 00"
97° 00' 00"
35° 15' 00"
35° 00' 00"
600,000 FEET
T9N
T8N
T7N
T6N
T5N
T4N
T3N
T2N
T1N
C O U N T Y
P O T T A W A T O M I E
L I N C O L N
P O N T O T O C
M c C L A I N
S E M I N O L E
C L E V E L A N D
O K L A H O M A
BOUNDARY
CENTER VIEW
GREEN LEAF
BARTA
SEMINOLE
OKEMAH
MACOMB
MAUD
KONAWA
MACLEAY
TO PRAGUE
TO SEMINOLE
TO OKEMAH
TO MACLEAY
TO KONAWA
TO MACLEAY
TO MACLEAY
TO MACLEAY

SEMINOLE

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OKLAHOMA CITY, OKLAHOMA 73105-3204

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NOT FOR RESALE


OKFUSKEE COUNTY
POTTAWATOMIE COUNTY
HUGHES COUNTY
SEMINOLE COUNTY
POTTAWATOMIE COUNTY
PONTOTOC COUNTY
R 5 E
R 6 E
R 7 E
R 8 E
T 11 N
T 10 N
T 9 N
T 8 N
T 7 N
T 6 N
T 5 N
T 12 N
2,380,000 FEET
2,440,000 FEET
580,000 FEET
96°45'00"
96°30'00"
35°15'00"
35°00'00"
BOUNDARY
INDIAN TERRITORY
OLD CANADIAN
NORTH CANADIAN
TREATY LINE
OKLAHOMA
TERRITORY
SEMINOLE
POP. 7,071
SEMINOLE MUNICIPAL AIRPORT
WEWOKA
POP. 4,050
CROMWELL
POP. 268
SCHOOLTON
BUTNER
EASLEY RD.
QUAIL RUN
QUAIL CREEK RD.
NOBLETOWN
SPORTSMAN LAKE
DANIELSON LAKE
INDOGCO
LIMA
POP. 133
BOWLEGS
POP. 398
MAUD
POP. 1204
POTTA-WATOMIE CO. POP. 868
SEMINOLE CO. POP. 336
KONAWA
POP. 1,508
SASAKWA
POP. 169
WOLF (SNOWIGHT) (SNOMAC)
TATE MTN.
DIXON
KWSH
SYLVIAN
LITTLE
MISSION
DECKER
TUCHO
EARL
ARGO
VAMOOSA
FERNDALE
CAROLINA
BOWLEGS
MANDLER
TO SHAWNEE
TO EARLSBORO
TO ST. LOUIS
TO ASHER
TO OKEMAH
TO BEARDEN
TO WETUMKA
TO HOLDENVILLE
TO ADA
TO PRAGUE
Deer Creek
Turkey Creek
Salt Creek
Bruno Creek
Jumper Creek
Sandy Creek
Rock Creek
Tiger Creek
Wewoka Creek
Little Wewoka Creek
Gar Creek
Coon Creek
Bird Creek
Mud Creek
Big Creek
Clear Creek
Duck Creek
Indian River
Little River
Canadian River
Katy Reservoir
Konawa Lake
Seminole Lake
Daniel Lake
Wewoka Lake
Lake Seminole
Wewoka Pacific Railroad
Union Pacific Railroad
E1118
E1135
E1205
E1235
E1248
E1252
E1255
E1305
E1307
E1312
E1338
E1387
E1395
E1418
E1421
E1462
E1467
E1183
N3688
D3020
D3030
D3043
D3070
D3075
D3545
D3585
D1208
D1241
D1247
N3613
N3435
N3353
N3359
N3365
N3525
N3543
N3605
N3625
N3623
N3455
N3315
N3607
N3465
N3585
N3626
N3644
N3500
N3648
N3613
N3435
N3626
N3605
N3623
N3455
N3315
N3607
N3465
N3585
N3644
N3500
N3648
D3030
D3043
D3070
D3075
D3545
D3585
D1208
D1241
D1247
D3020
E1118
E1135
E1205
E1235
E1248
E1252
E1255
E1305
E1307
E1312
E1338
E1387
E1395
E1418
E1421
E1462
E1467
E1183
N3688
N3353
N3359
N3365
N3525
N3543
N3605
N3625
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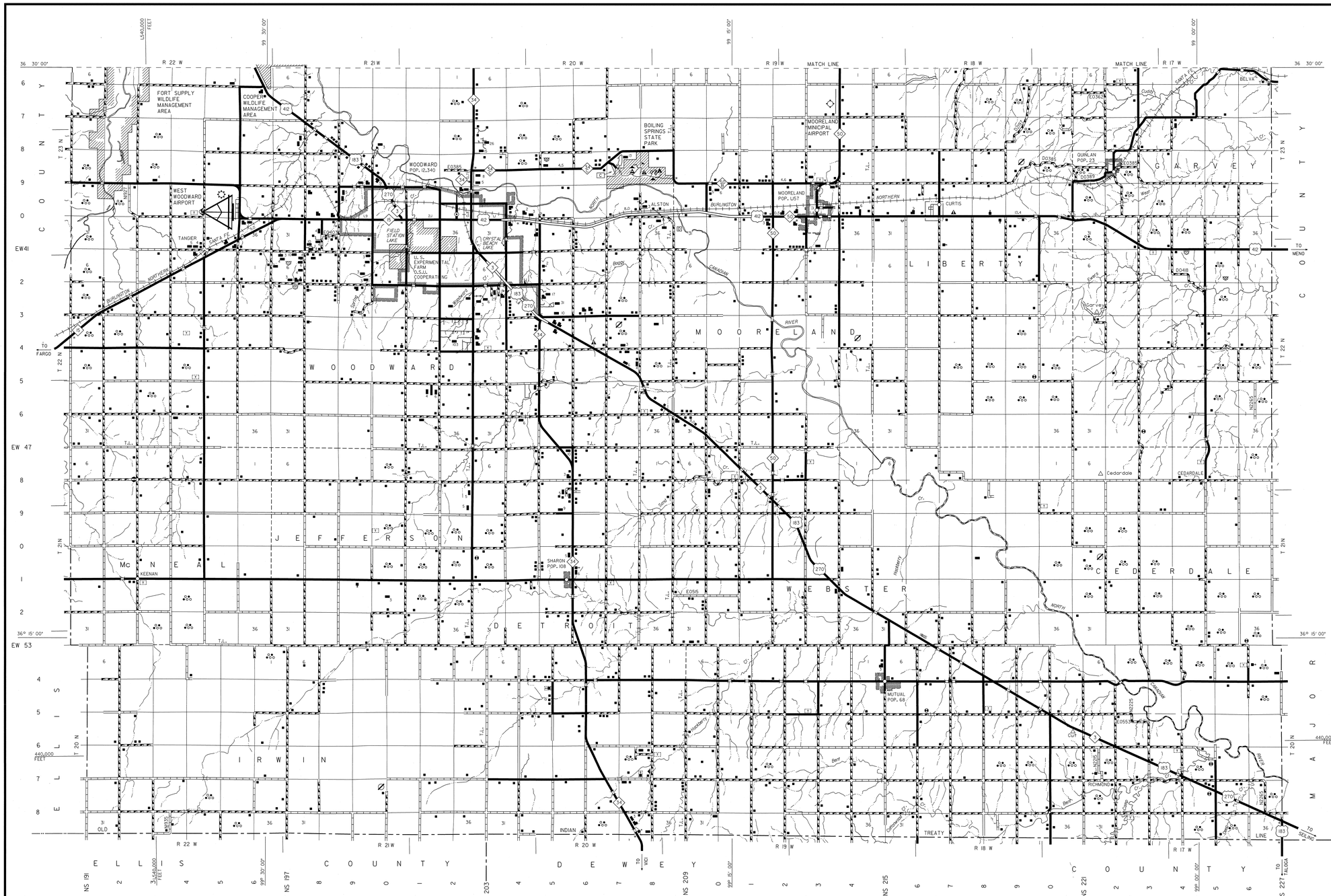
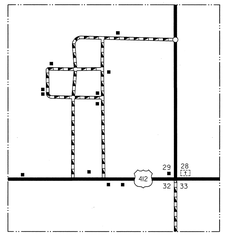
N3648
N3613
N3435




## LEGEND

- U.S.NUMBERED HIGHWAY
- STATE NUMBERED HIGHWAY
- INTERSTATE HIGHWAY ROUTE
- PAVED ROAD
- GRAVEL ROAD
- GRADED & DRAINED ROAD
- UNIMPROVED ROAD
- PRIMITIVE ROAD
- PROJECTED ROAD
- RESIDENTIAL ROAD
- COUNTY ROAD ID NO.
- MILEAGE BETWEEN POINTS
- DIVIDED HIGHWAY, 4 OR MORE LANES
- UNDIVIDED HIGHWAY, 3 OR MORE LANES
- TRAFFIC CIRCLE
- HIGHWAY GRADE SEPARATION
- TRAFFIC INTERCHANGE
- STATE LINE
- COUNTY LINE
- CIVIL TOWNSHIP LINE
- SECTION LINE
- RURAL DEVELOPMENT AREA
- GOVERNMENT PROPERTY LINE
- MATCH LINE
- COUNTY SEAT
- TOWN CENTER
- CORPORATE LIMITS
- CIVIL TOWNSHIP, ROAD IN PLACE
- INSET BOUNDARY

- RAILROAD, ANY NUMBER OF TRACKS
- RAILROAD WITH STATION INDICATED
- GRADE CROSSING
- UNDERPASS, R.R. ABOVE
- OVERPASS, R.R. BELOW
- RAILROAD ON STREET
- MILITARY AIRFIELD
- AIRPORT WITH COMPLETE FACILITIES
- AIRPORT WITH LIMITED FACILITIES
- LANDING STRIP, PRIVATE FIELD
- AIRPORT, GENERAL OUTLINE OF FIELD
- RUNWAYS SHOWN IN POSITION
- ROADSIDE PARK Picnic Grounds
- PLAYGROUNDS
- BATHING BEACH OR SWIMMING POOL
- SCENIC SITE
- MOTEL
- CAMP OR LODGE, Permanent with buildings
  SP–State, CP–County
- SMALL PARK MP–Municipal, TP–Trailer Park
- FOREST RANGER STATION
- OBSERVATION OR LOOKOUT TOWER
- CAMP SITE
- FISH HATCHERY
- GOLF COURSE OR COUNTRY CLUB
- ATHLETIC FIELD OR AMUSEMENT PARK
- FAIRGROUNDS, RACE COURSE
- DWELLING
- NUMBER OF DWELLINGS CLOSELY SPACED
- COMBINED BUSINESS AND DWELLING
- POST OFFICE
- POST OFFICE COMBINATIONS

- 1867 ELEVATION ABOVE SEA LEVEL
- MOUNTAIN RANGE, BUTTE OR MESA
- SMALL MONUMENT
- MARSH OR SWAMP LANDS
- DRAINAGE DITCH
- IRRIGATION DITCH
- LAKE, RESERVOIR OR POND WITH DAM
- ROAD OVER DAM
- DRY LAKE SUBJECT TO FLOOD
- SMALL BRIDGES CLOSELY SPACED
- HIGHWAY BRIDGE, OVER 20FT. IN LENGTH
- GENERAL BRIDGE, LONG CROSSING
- ARCH BRIDGE
- TRUSS BRIDGE,W–WOOD,S–STEEL,C–CONCRETE
- CONCRETE DIP OR FORD
- FORD ROAD ESTABLISHED
- INTERMITTENT STREAM
- NARROW STREAM
- DOCK PIER OR LANDING
- NAVIGABLE STREAM WITH LOCK & DAM
- WIDE STREAM OR RIVER
- TRIANGULATION STATION

- SEASONAL DWELLINGS
- CHURCH OR OTHER RELIGIOUS BUILDING
- CEMETERY
- CHURCH WITH CEMETERY ADJACENT
- REST HOME
- HOSPITAL
- SMALL BUSINESS
- INDUSTRY
- SAW MILL
- MINE SHAFT OR DRIFT
- OIL OR GAS FIELD
- GAUGING OR PUMPING STATION
- WAREHOUSE
- GRAVEL PIT
- QUARRY
- SCHOOL
- COMMUNITY HALL OR LODGE
- DRIVE–IN THEATER
- CORRECTIONAL INSTITUTION
- HIGHWAY GARAGE
- JUNK YARDS & DUMPS A–Automobile, B–Scrap Building Material, D–Refuse, Garbage or trash dump, F–Sanitary Fill, O–Other
- SEWAGE DISPOSAL PLANT
- WATER SUPPLY STAND PIPE
- POWER PLANT
- BOOSTER STATION
- POWER SUBSTATION
- TELEVISION OR RADIO STATION
- MILITARY INSTALLATION

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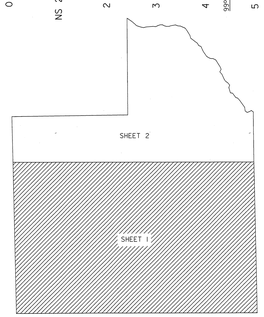
STATE SYSTEM REVISED TO AUGUST 1999




# GENERAL HIGHWAY MAP
# WOODWARD COUNTY
## OKLAHOMA

PREPARED BY THE
OKLAHOMA DEPARTMENT OF TRANSPORTATION
PLANNING DIVISION

IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE IN MILES
1 0 1 2 3 4 5 MILES

0 1 2 3 4 5 6 7 8 9 10 KILOMETERS
SCALE IN KILOMETERS

LAMBERT CONFORMAL CONIC PROJECTION U.S. & GEODETIC SURVEY DATA
20,000 FOOT GRID; OKLAHOMA PLANE COORDINATE SYSTEM NORTH PROJECTION ZONE.
POPULATION FIGURES BASED ON 1990 U.S. CENSUS
CO. POP 18,976

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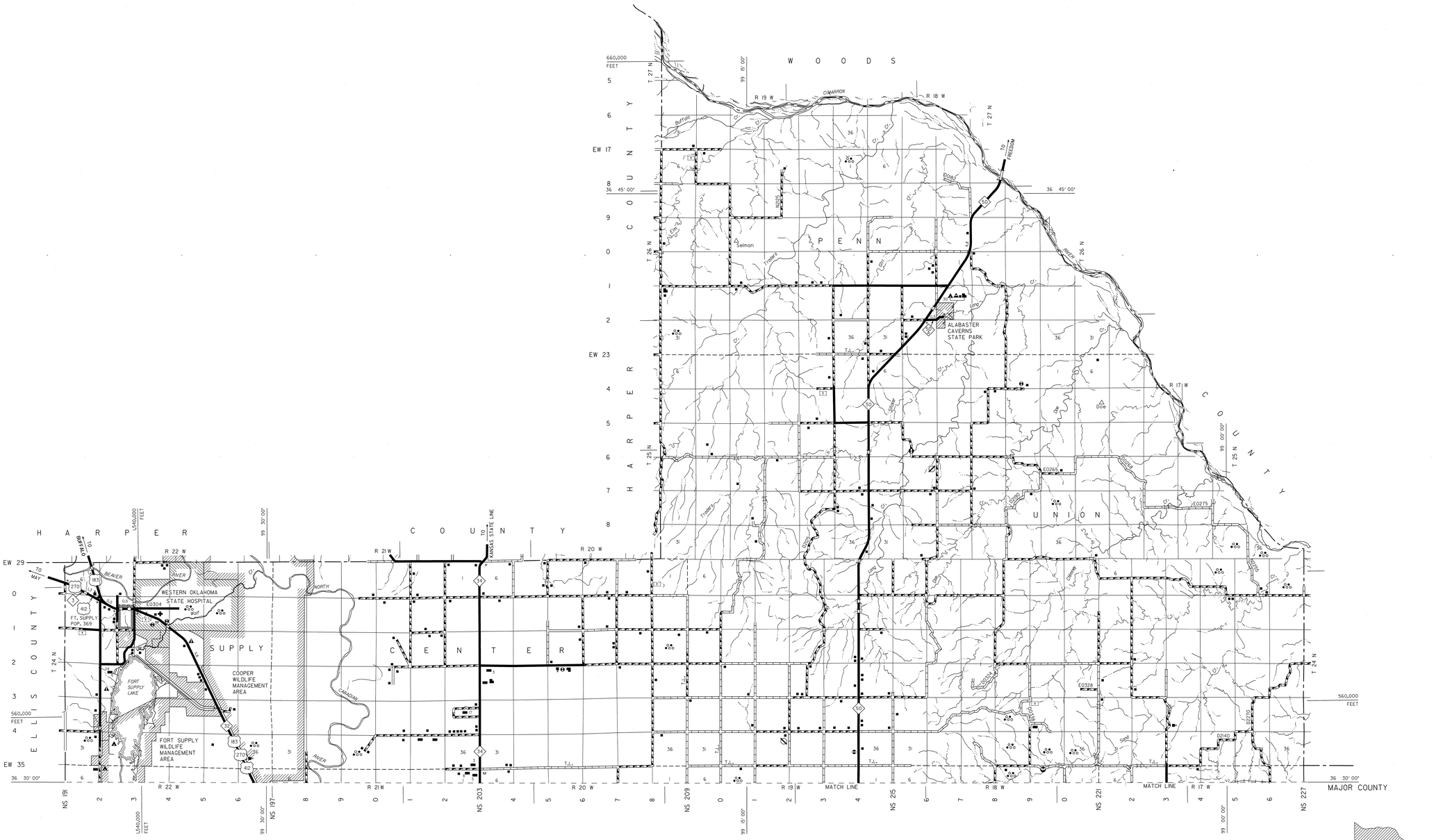


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