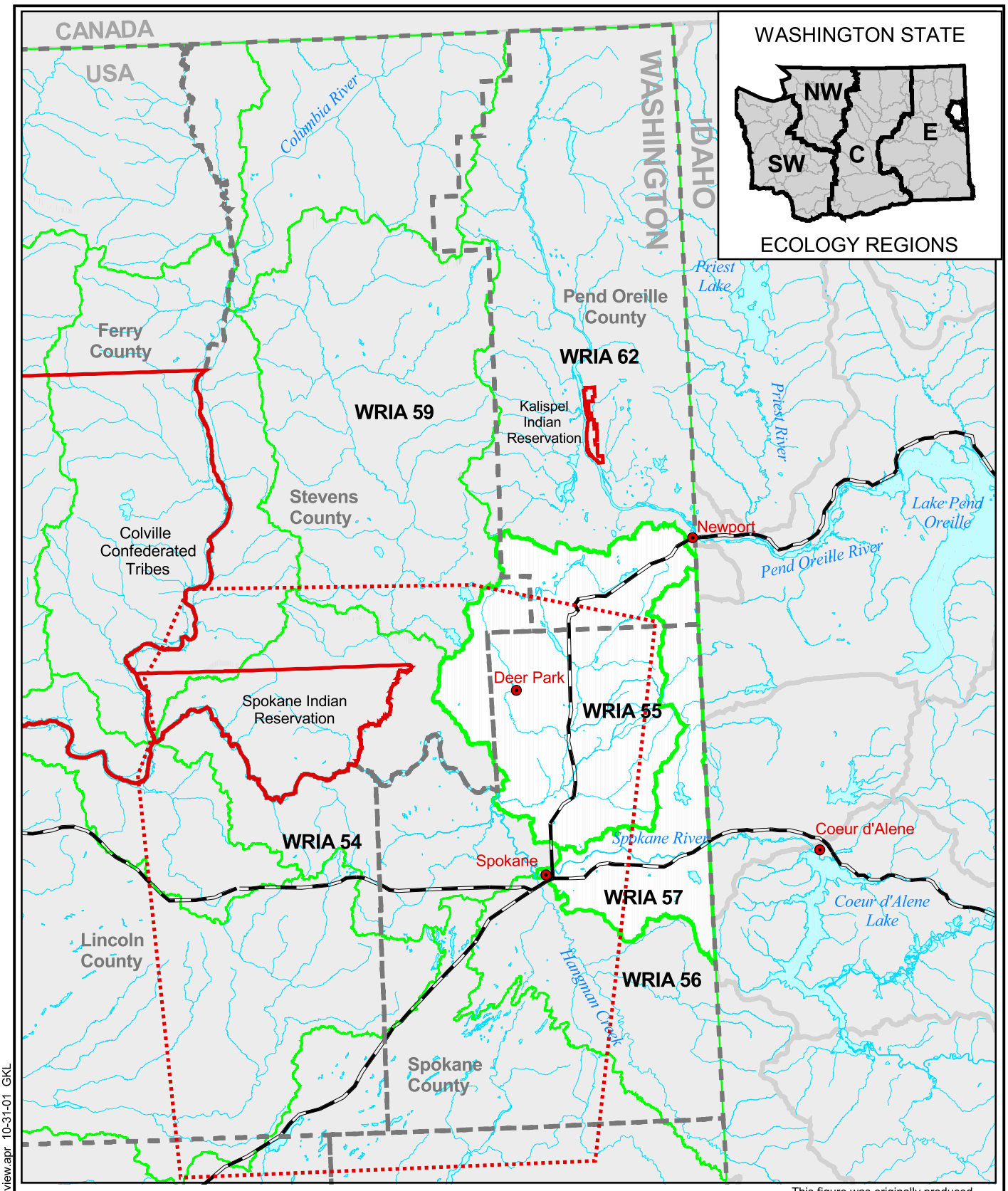

Legend

- WRIA Boundaries
- HUC4 Boundaries
- Cities
- County Boundaries
- Roads
- Rivers and Streams
- Indian Reservations
- Spokane Tribal Ancestral Lands

N

0 15

Scale 1" = 15 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

This figure was originally produced in color. Reproduction in black and white may result in loss of information.

Original Data Source: WDOE, USGS, Spokane Indian Tribe

Golder Associates

Overview

Drawn: GKL	App'd:	Date: June 17, 2003	Figure: 1.1

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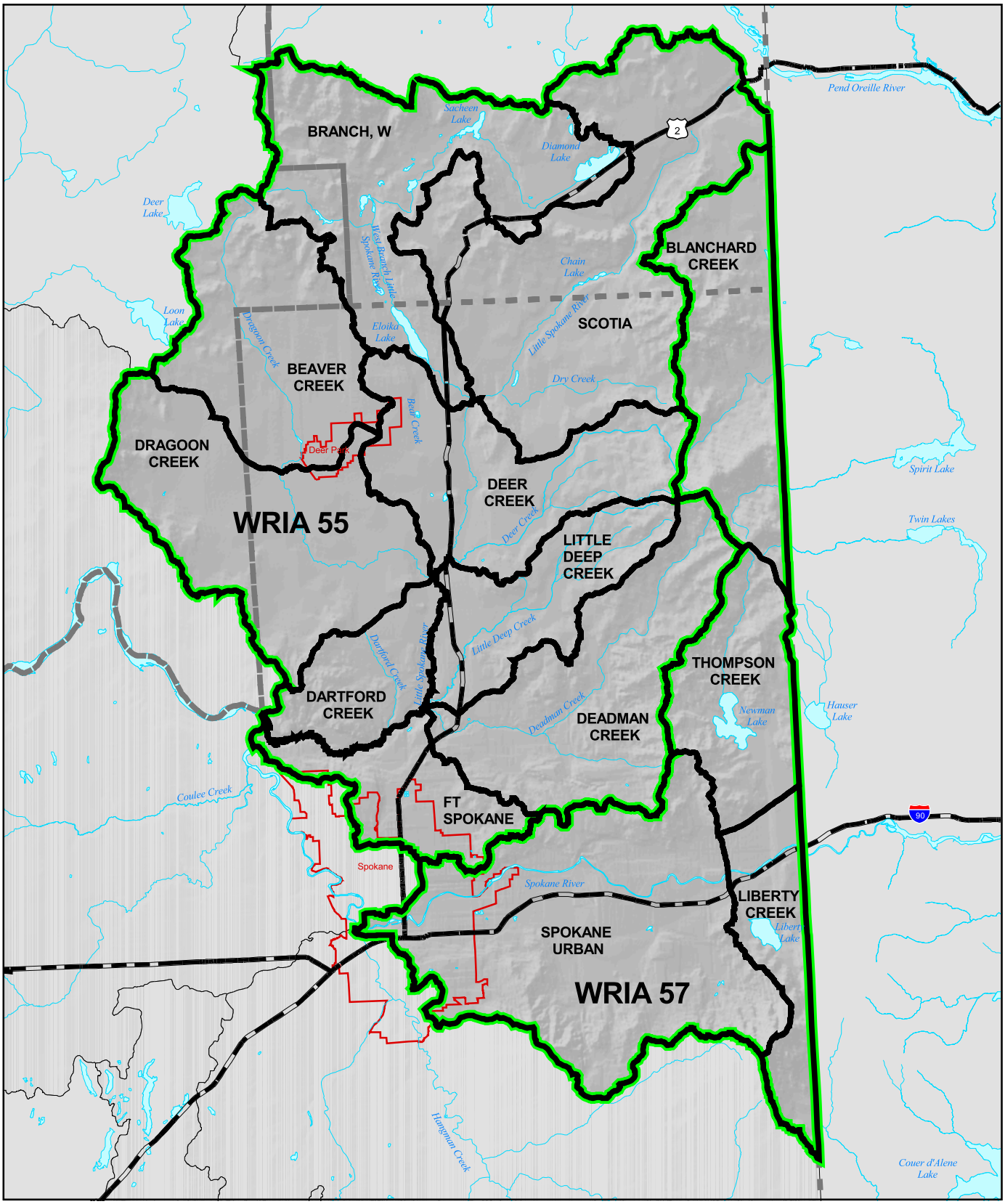

This figure was originally produced in color. Reproduction in black and white may result in loss of information.

LEGEND

- WRIA Boundaries
- WAU Boundaries
- City Limits
- County Boundaries
- Roads
- Rivers and Streams

N

0 6

Scale 1" = 6 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

Original Data Source: Washington Department of Ecology, Spokane County, WA Department of Natural Resources

Golder Associates

Watershed Administrative Unit Boundaries

Drawn: GKL	App'd:	Date: Oct. 31, 2001	Figure: 1.2

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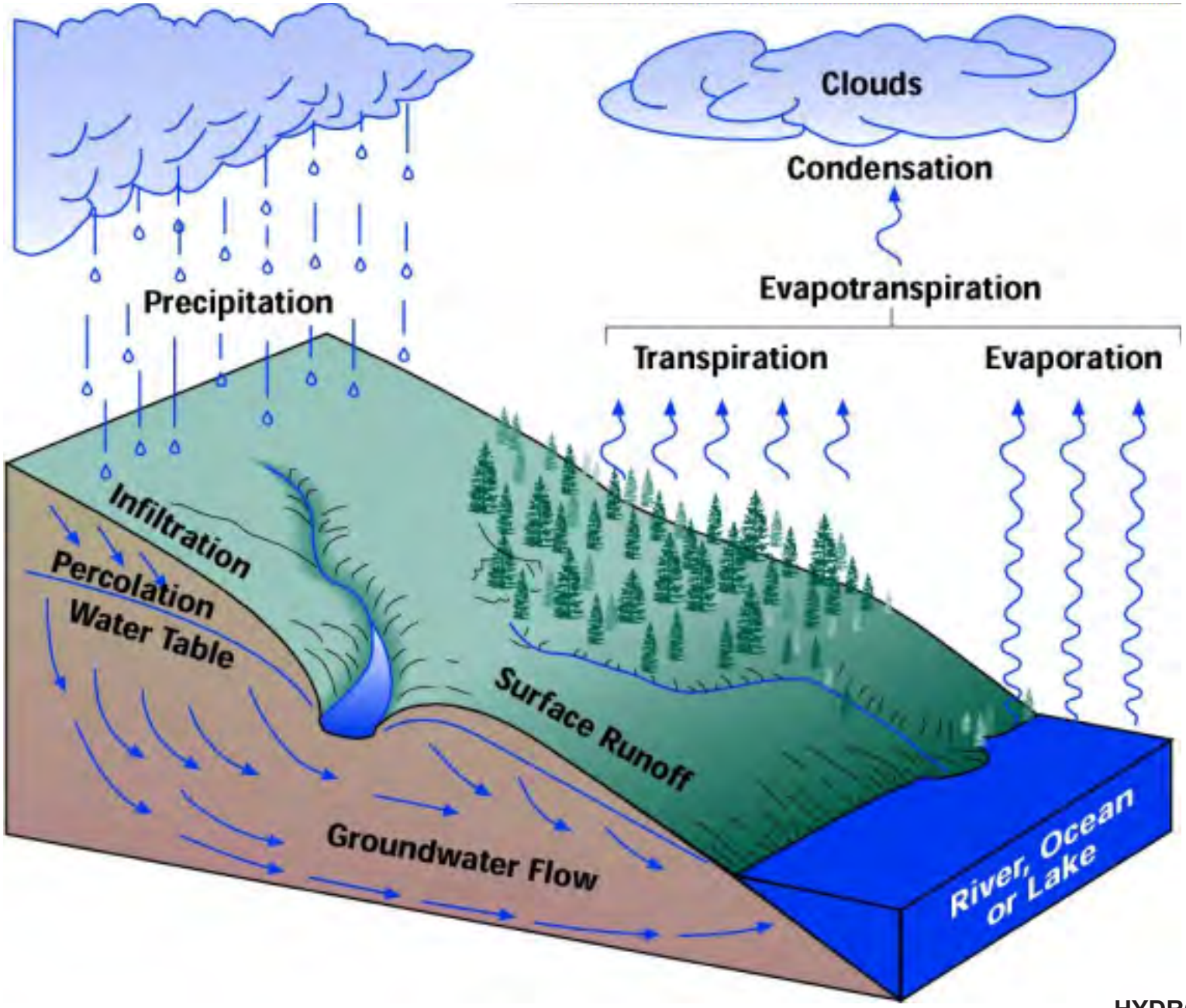

FIGURE **3.1**
HYDROLOGIC CYCLE
SPOKANE COUNTY/LEVEL I ASSESSMENT/WA

PROJECT NO. 013 1372_1700 DRAWING NO. 92886 DATE 10/15/01 DRAWN BY ETF

Golder Associates

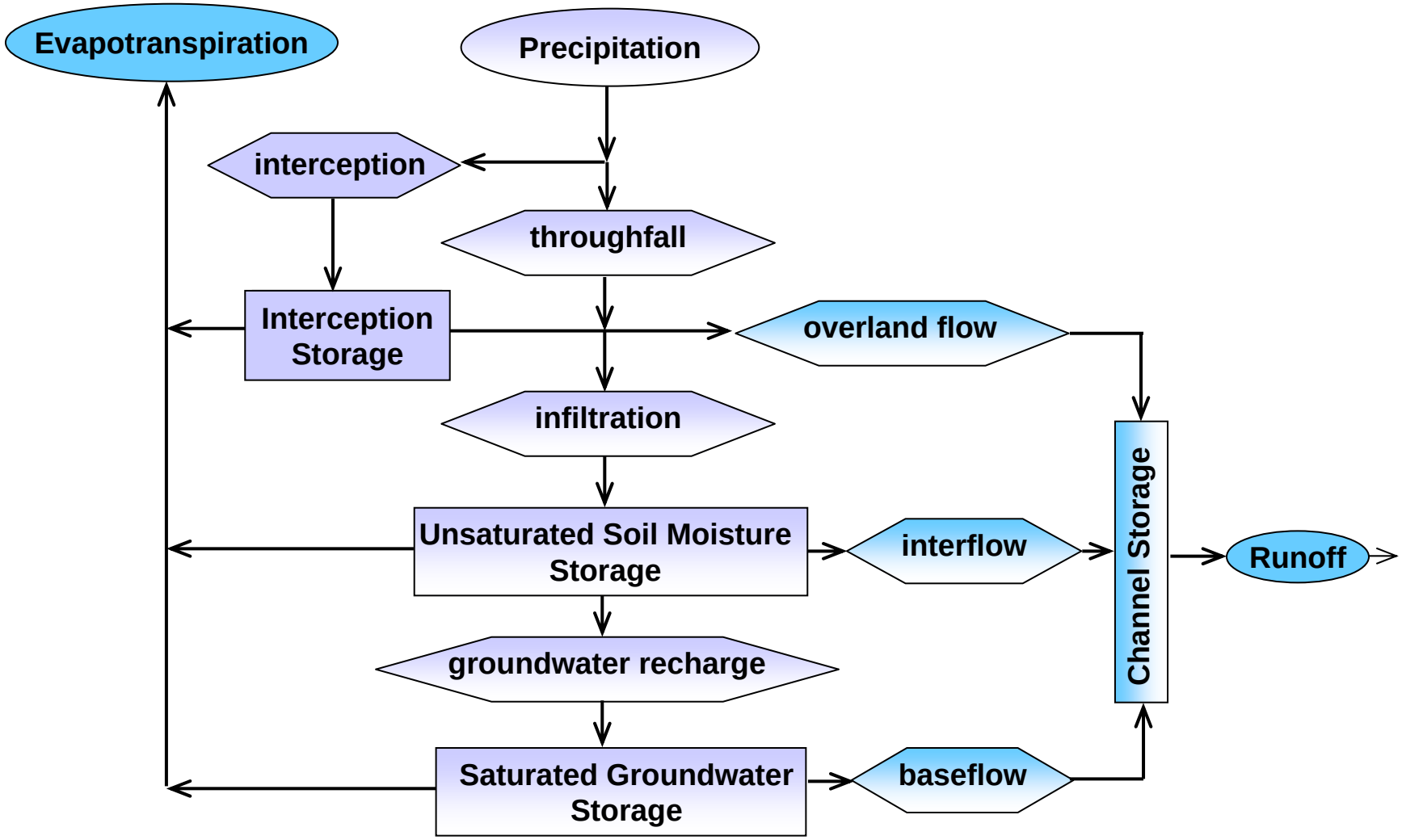

FIGURE **3.2**

SYSTEMS REPRESENTATION OF THE HYDROLOGIC CYCLE

SPOKANE COUNTY / LEVEL 1 ASSESSMENT / WA

Adapted from Freeze and Cherry, 1978.

PROJECT NO. 013-1372.1700 DRAWING NO. DATE 10/15/01

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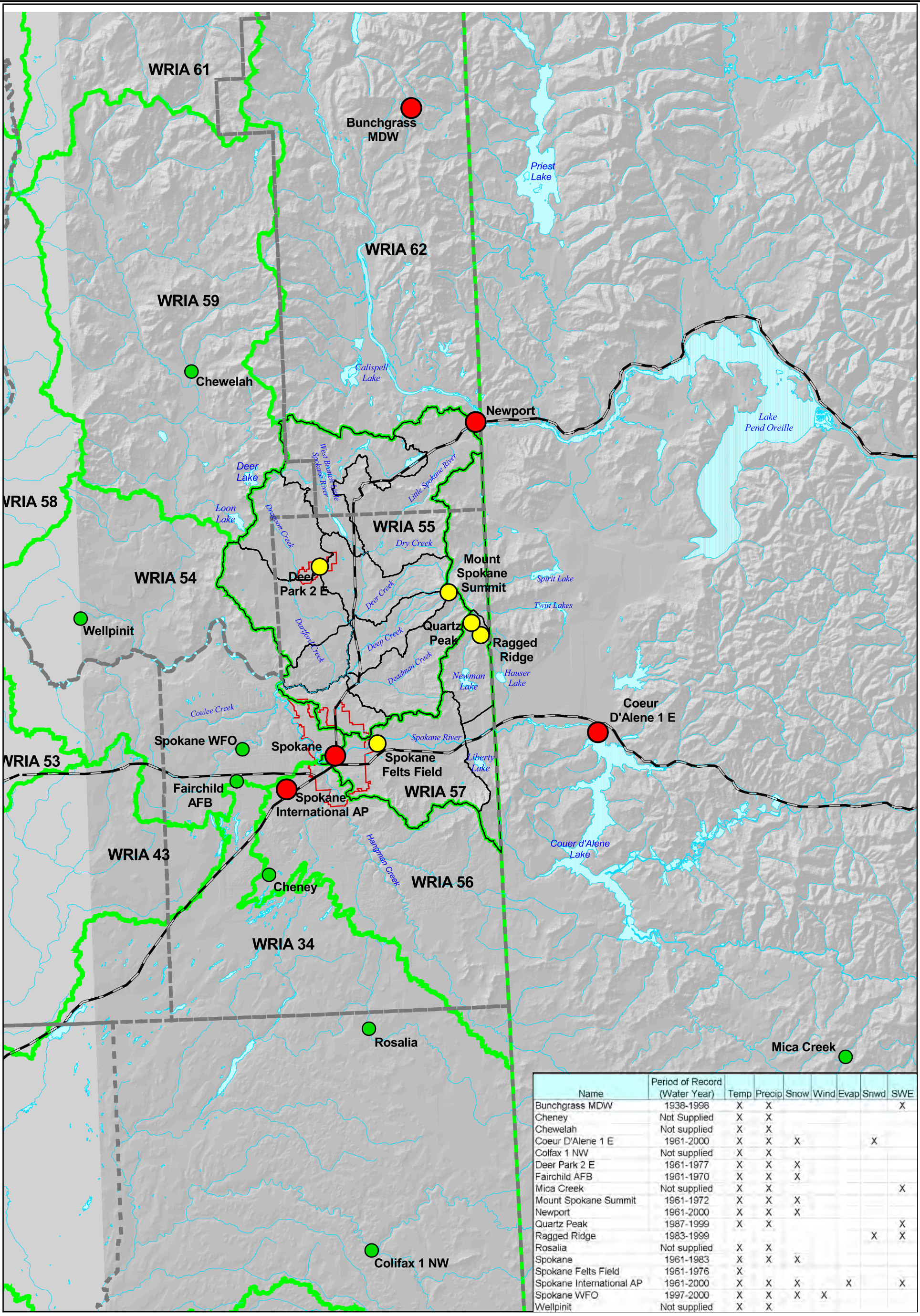

Name	Period of Record (Water Year)	Temp	Precip	Snow	Wind	Evap	Snwd	SWE
Bunchgrass MDW	1938-1998	X	X					X
Cheney	Not Supplied	X	X					
Chewelah	Not supplied	X	X					
Coeur D'Alene 1 E	1961-2000	X	X	X			X	
Colfax 1 NW	Not supplied	X	X					
Deer Park 2 E	1961-1977	X	X	X				
Fairchild AFB	1961-1970	X	X	X				
Mica Creek	Not supplied	X	X					X
Mount Spokane Summit	1961-1972	X	X	X				
Newport	1961-2000	X	X	X				
Quartz Peak	1987-1999	X	X					X
Ragged Ridge	1983-1999						X	X
Rosalia	Not supplied	X	X					
Spokane	1961-1983	X	X	X				
Spokane Felts Field	1961-1976	X						
Spokane International AP	1961-2000	X	X	X		X		X
Spokane WFO	1997-2000	X	X	X	X			
Wellpinit	Not supplied	X	X					

This figure was originally produced in color. Reproduction in black and white may result in loss of information.

Legend

- WRIA Boundaries
- WAU Boundaries
- City Limits
- County Boundaries
- Roads
- Rivers and Streams

Period of Record	
	> 20
	> 10
	< 10

N

0 10

Scale 1" = 10 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

Original Data Source: Washington Department of Ecology, USGS

Golder Associates

Weather Stations

Drawn: GKL | App'd: | Date: Oct. 31, 2001 | Figure: **4.1**

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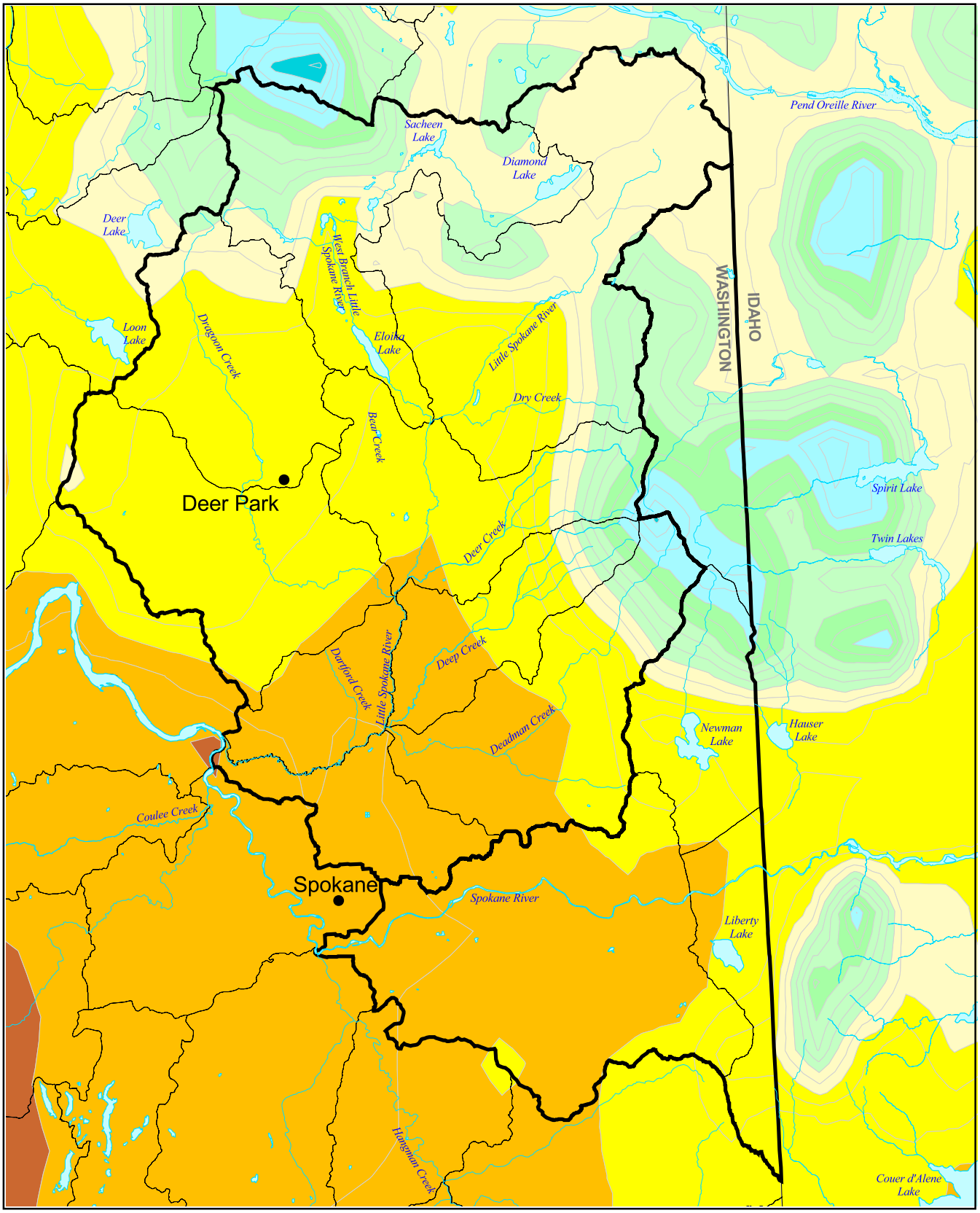


LEGEND

- WRIA Boundary
- WAU Boundary

Annual Rainfall

15" or less — 50" or more

N

0 — 6

Scale 1" = 6 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

Original Data Source: Washington Department of Ecology, The Climate Source

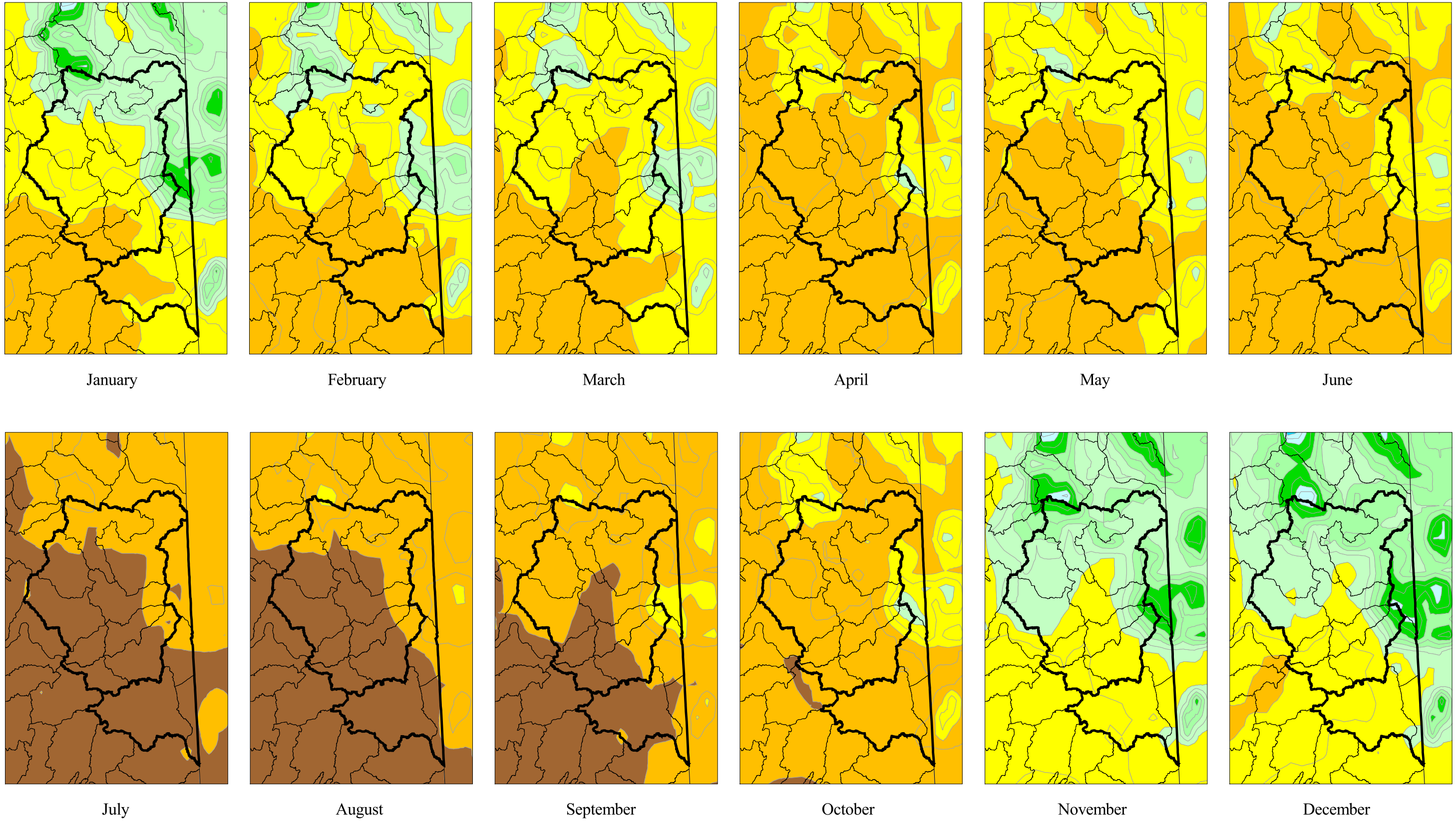
This figure was originally produced in color. Reproduction in black and white may result in loss of information.

Golder Associates

Average Annual PRISM Precipitation

Drawn: GKL	App'd:	Date: Oct. 31, 2001	Figure: 4.2

L:\Projects\2001\0131327\gis\aprs\overview.apr 10-31-01 GKL



Legend

WRIA Boundary

WAU Boundary

Monthly Rainfall

1" or less — 8" or more

N

0 — 20

Scale 1" = 20 Miles

This figure was originally produced in color.
Reproduction in black and white may result in loss of information.

Map Projection: Washinton State Plane
North Zone, NAD83, Feet

Original Data Source:
Oregon Climate Service

Golder Associates

Average Monthly PRISM Precipitation

Drawn:GKL	App'd:	Date: Oct. 31, 2001	Figure: 4.3

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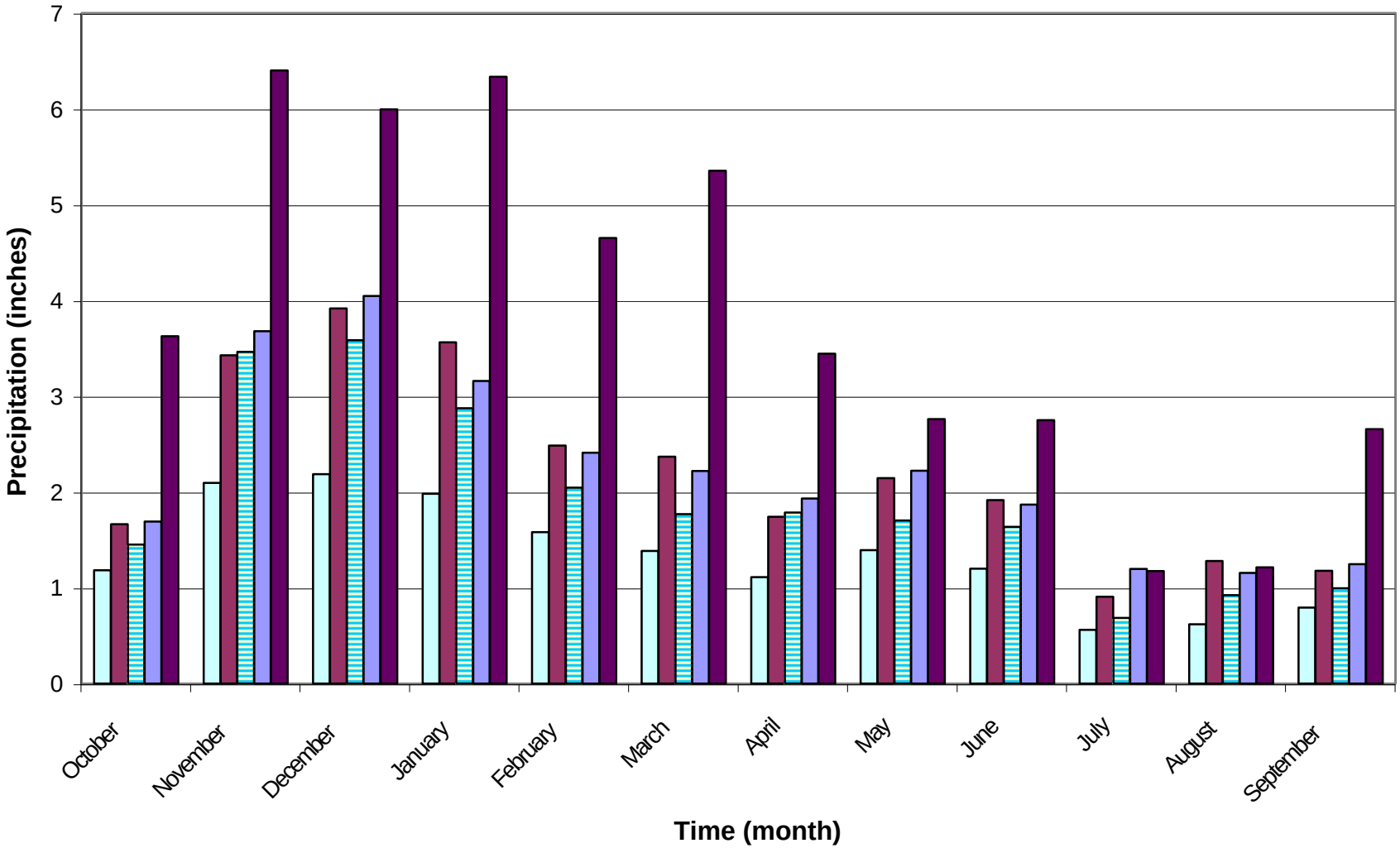


Legend

- Spokane International Airport
- Coeur d'Alene 1 E
- Deer Park 2 E
- Newport
- Mount Spokane Summit

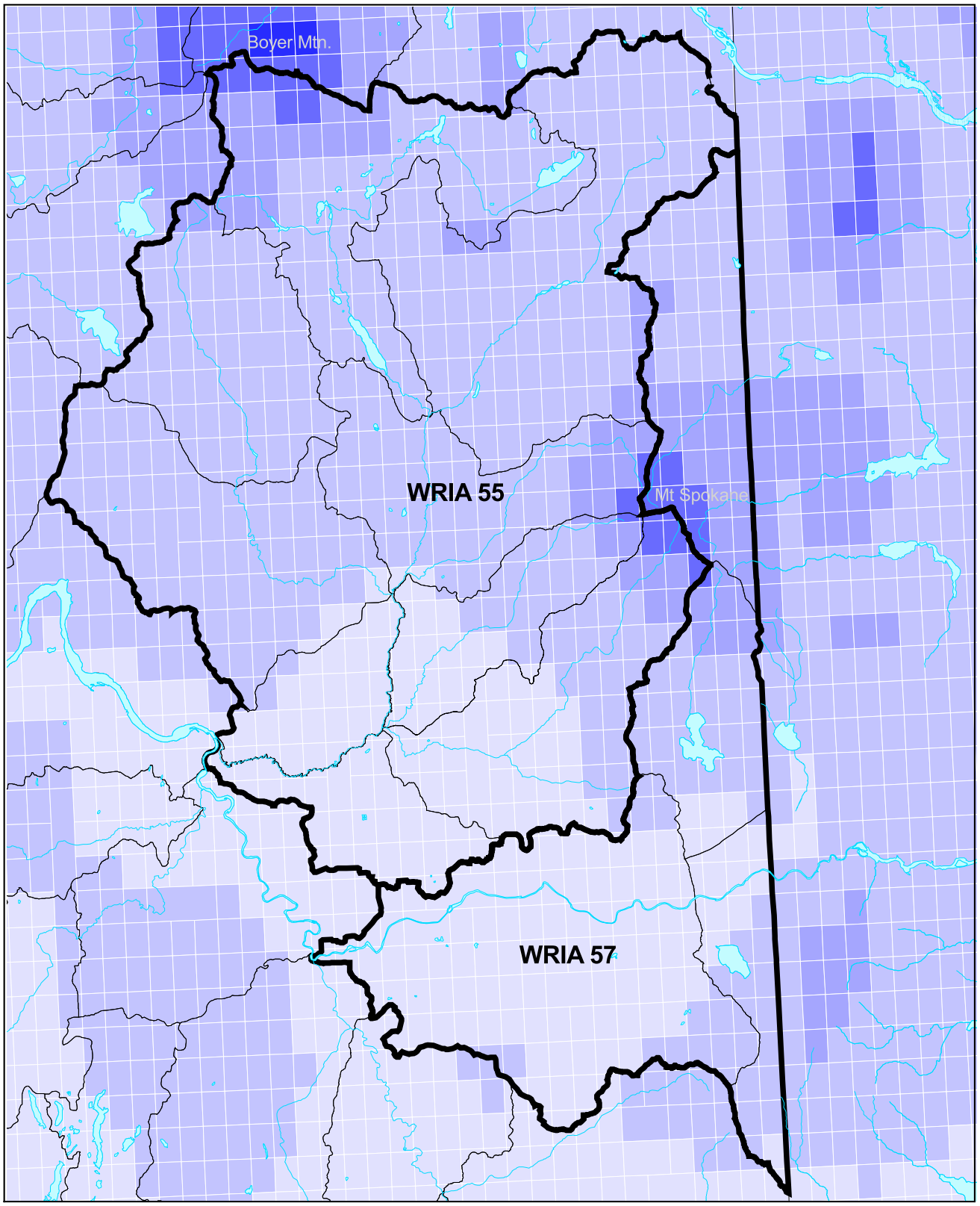
FIGURE 4.4:

Average Monthly Precipitation

Spokane County
Wastershed Assessment

013-1392, tables for rpt.xls, 09/13/2001

Golder Associates



This figure was originally produced in color. Reproduction in black and white may result in loss of information.

LEGEND

- WRIA Boundary
- WAU Boundary
- Lakes
- Rivers

Mean Annual Snowfall

3 ft" or less — 15 ft" or more

N

0 — 6

Scale 1" = 6 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

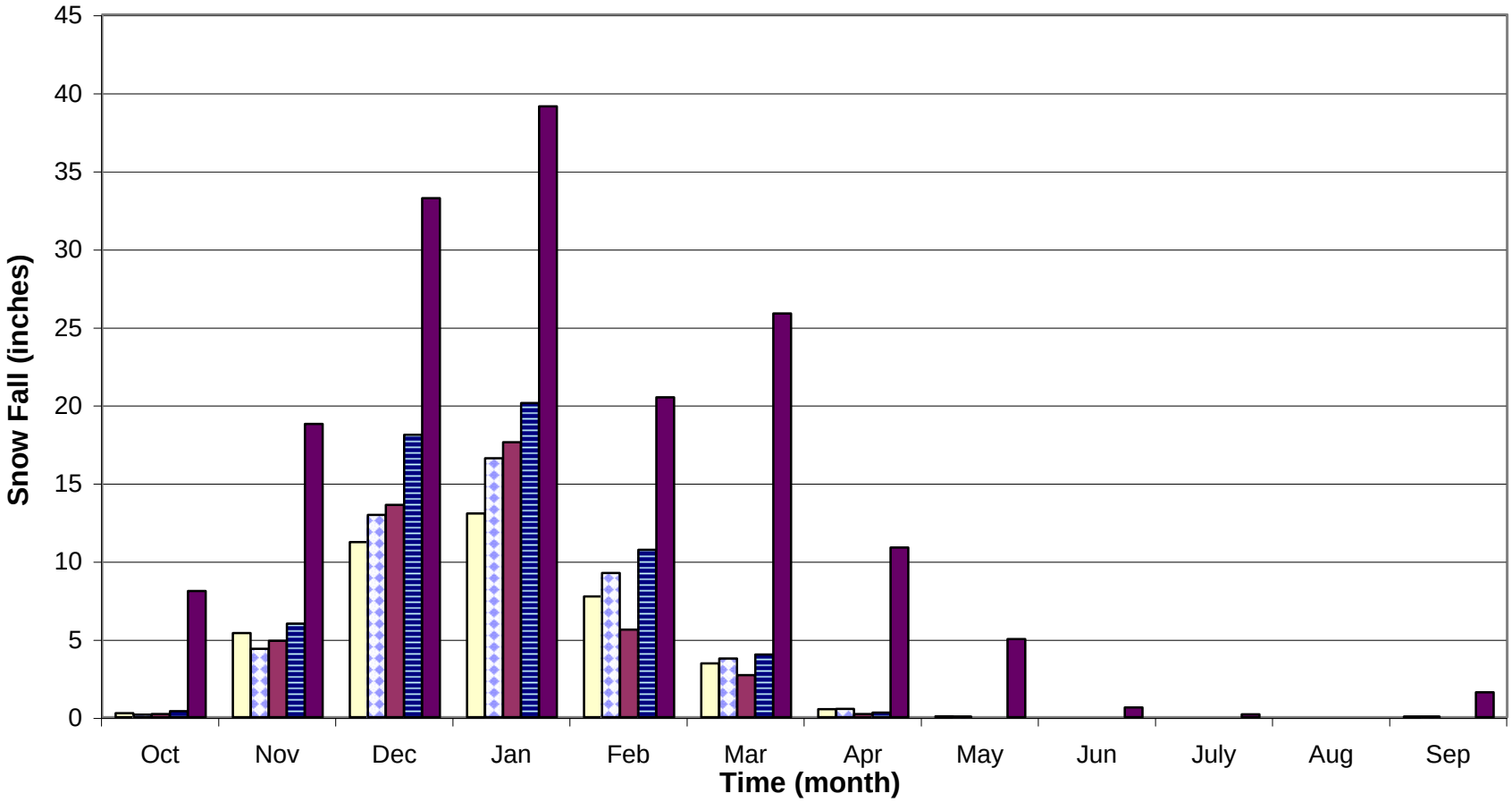
Original Data Source: Oregon Climate Service

Golder Associates

Average Annual PRISM Snowfall

Drawn: GKL	App'd:	Date: Oct. 31, 2001	Figure: 4.5

L:\projects\2001\0131327\gis\aprs\overview.apr 10-31-01 GKL



Legend

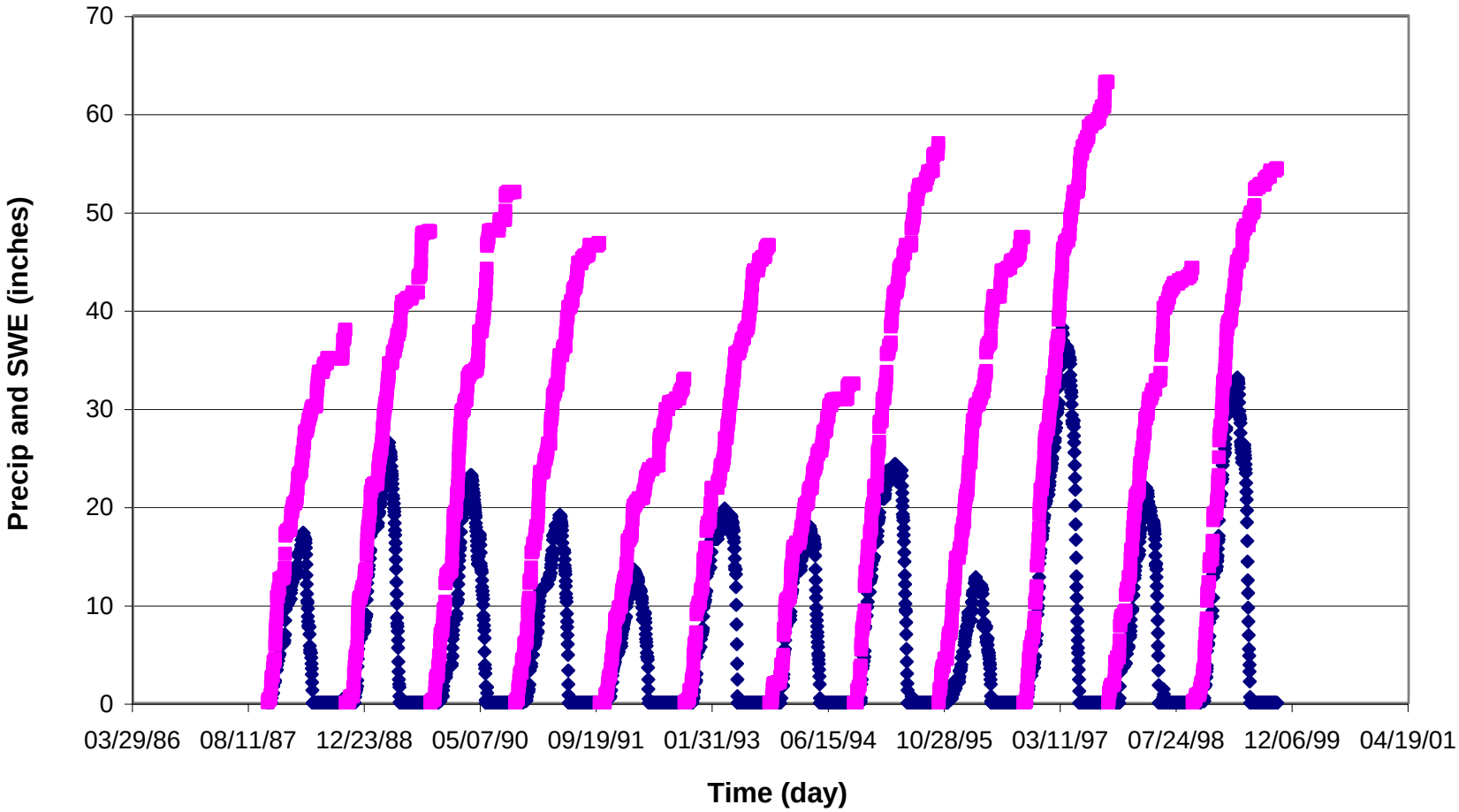
- Spokane International Airport
- Coeur d' Alene 1 E
- Deer Park 2 E
- Newport
- Mt Spokane Summit

FIGURE 4.6:
Average Monthly Snowfall

Spokane County
Watershed Assessment

013-1392, tables for rpt.xls, 07/25/2001

Golder Associates



Legend

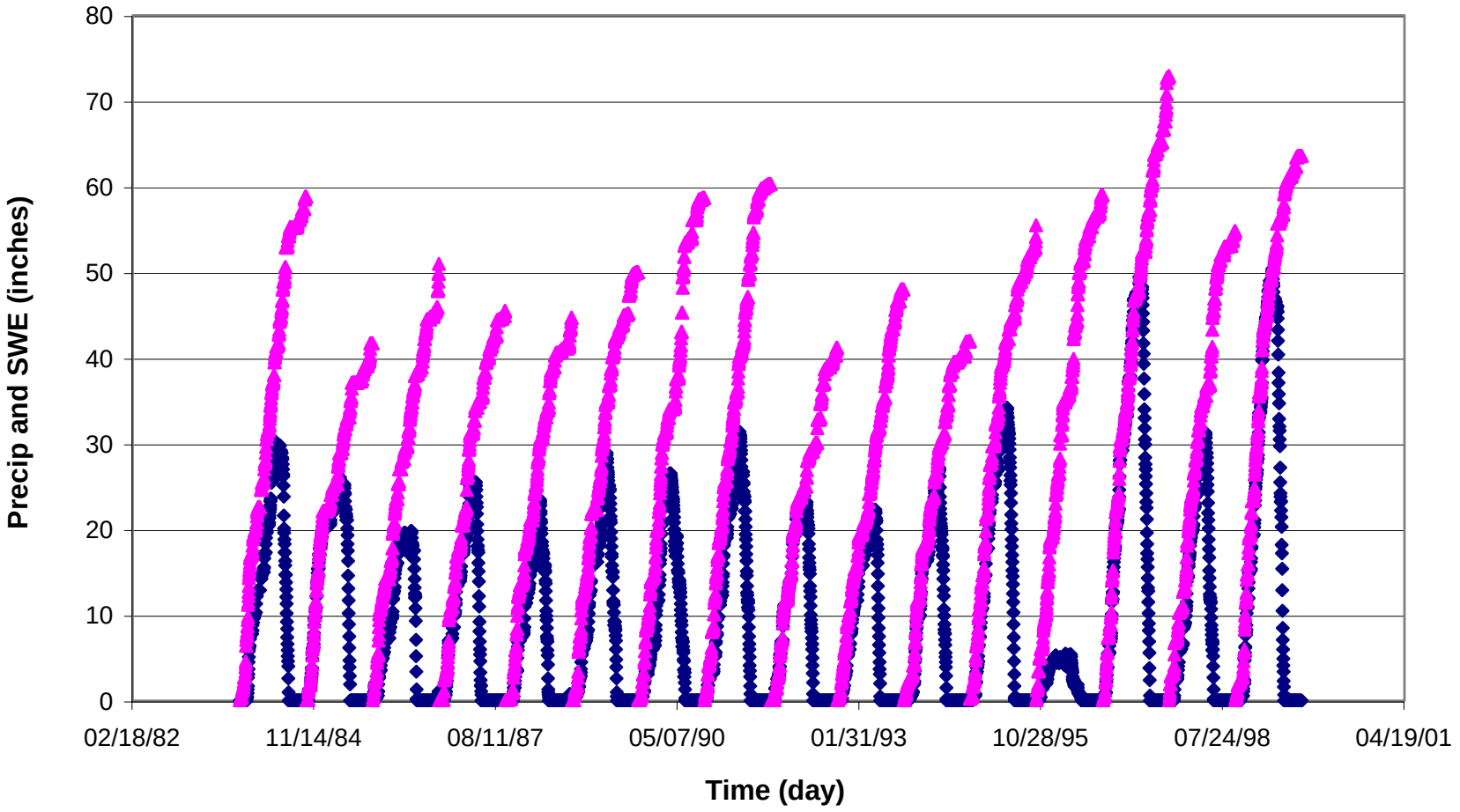
- Snow
- Precipitation

FIGURE 4.7a: Accumulated Daily Precipitation and Snow Water Equivalent (SWE) - Quartz Peak, stn 45031

Spokane County
Watershed Assessment

013-1392, SWE vs Prcp.xls, 08/07/2001

Golder Associates



Legend

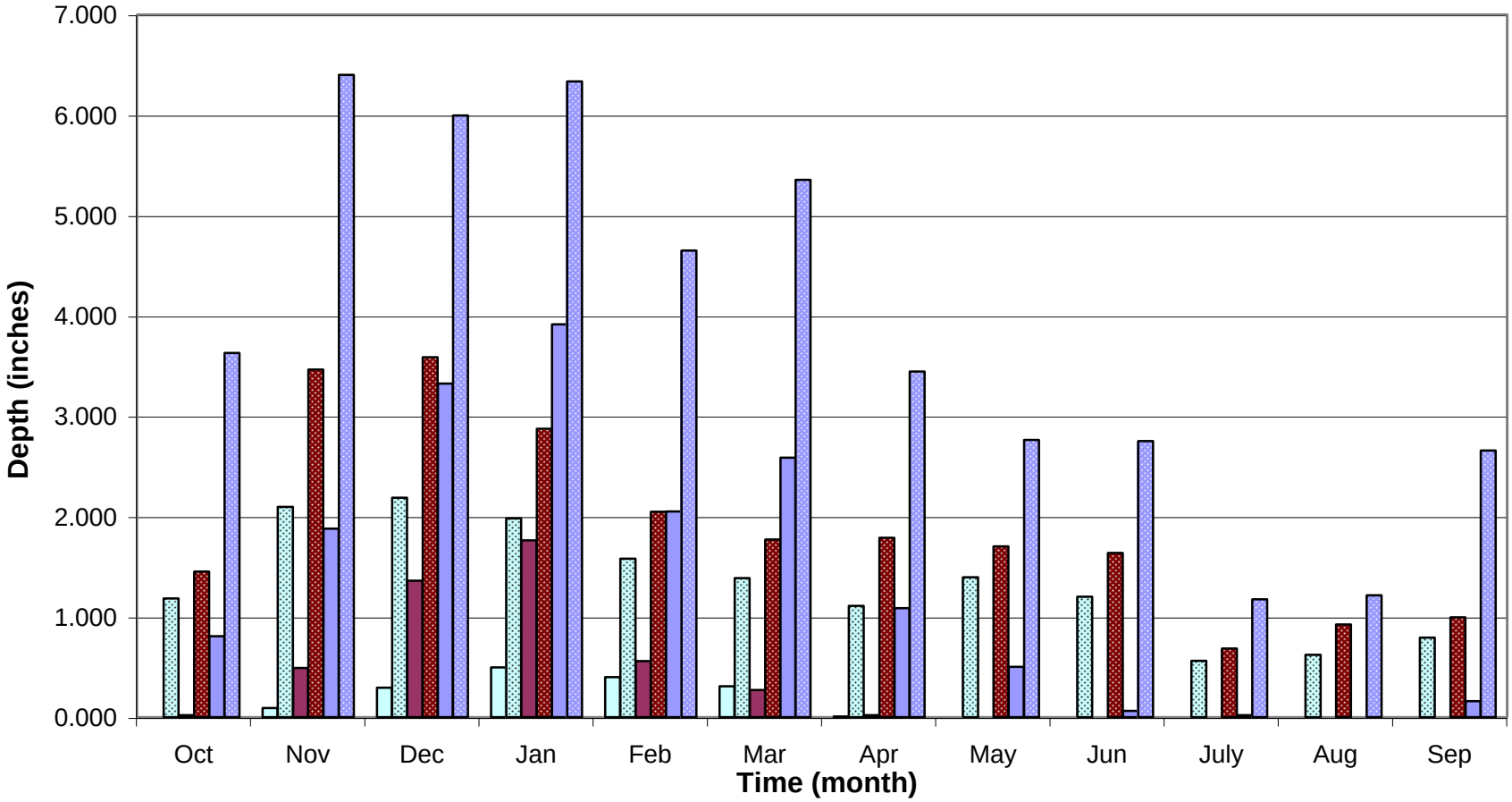
- Snow
- Precipitation

FIGURE 4.7b: Accumulated Daily Precipitation and Snow Water Equivalent (SWE) - Bunchgrass MDW, stn 45004

Spokane County
Watershed Assessment

013-1392, SWE vs Prcp.xls, 08/07/2001

Golder Associates



Legend

- Spokane International Airport - SWE
- Spokane International Airport - PRCP
- Deer Park 2 E - SWE
- Deer Park 2 E - PRCP
- Mt. Spokane Summit - SWE
- Mt Spokane Summit - PRCP

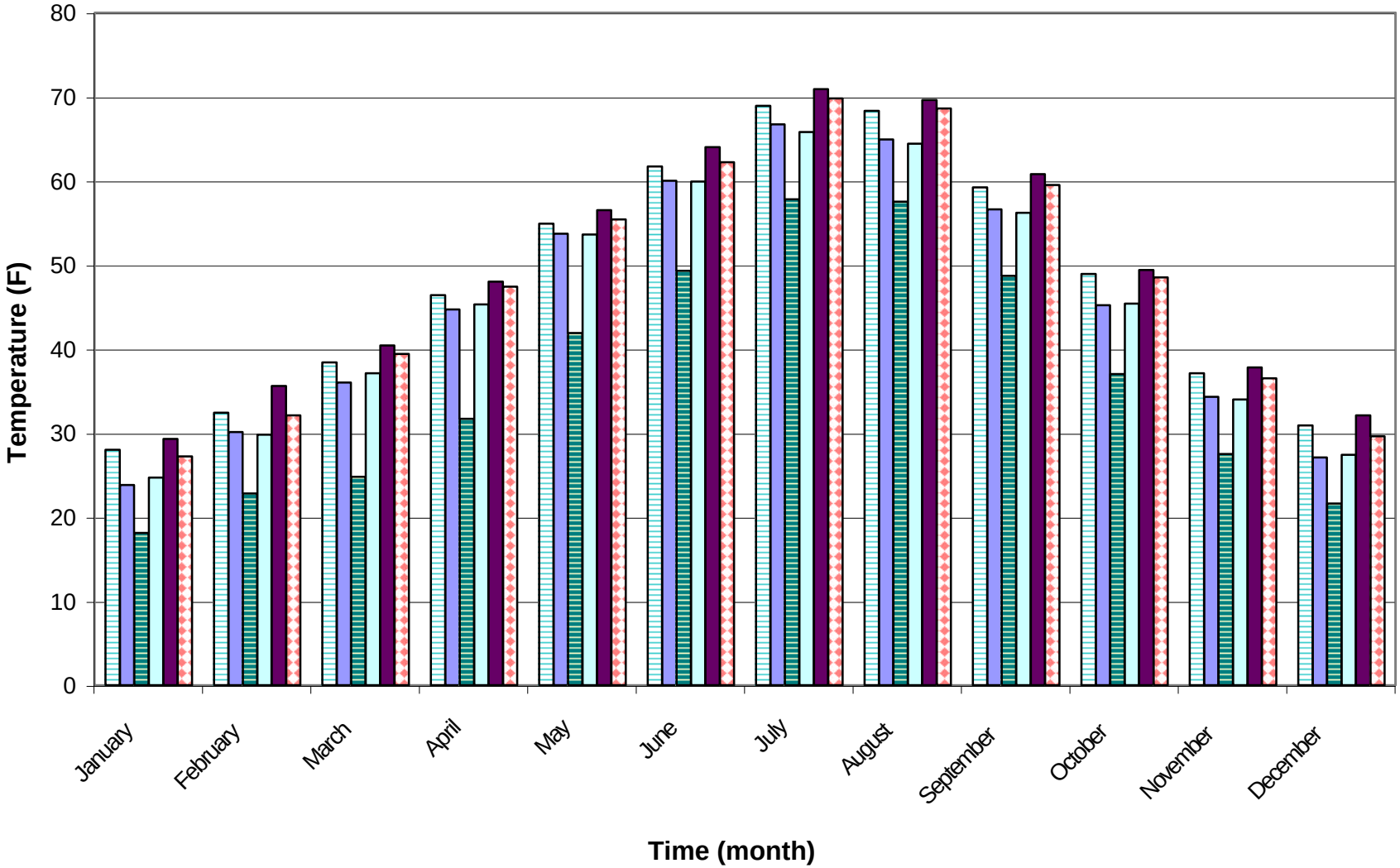
Note: SWE for Deer Park and Mr. Spokanecalculated by assuming that 1 inch snow fall = .1 inch SWE. (Linsley, et.al., 1992). Spokane International Airport based on collected data

FIGURE 4.8:
Monthly Precipitation (PRCP) vs. Snow Water Equivalent (SWE)

Spokane County
Watershed Assessment

013-1392, tables for rpt.xls, 09/13/2001

Golder Associates



Legend

- Coeur d'Alene 1 E
- Deer Park 2 E
- Mt Spokane Summit
- Newport
- Spokane
- Spokane International Airport

FIGURE 4.9:

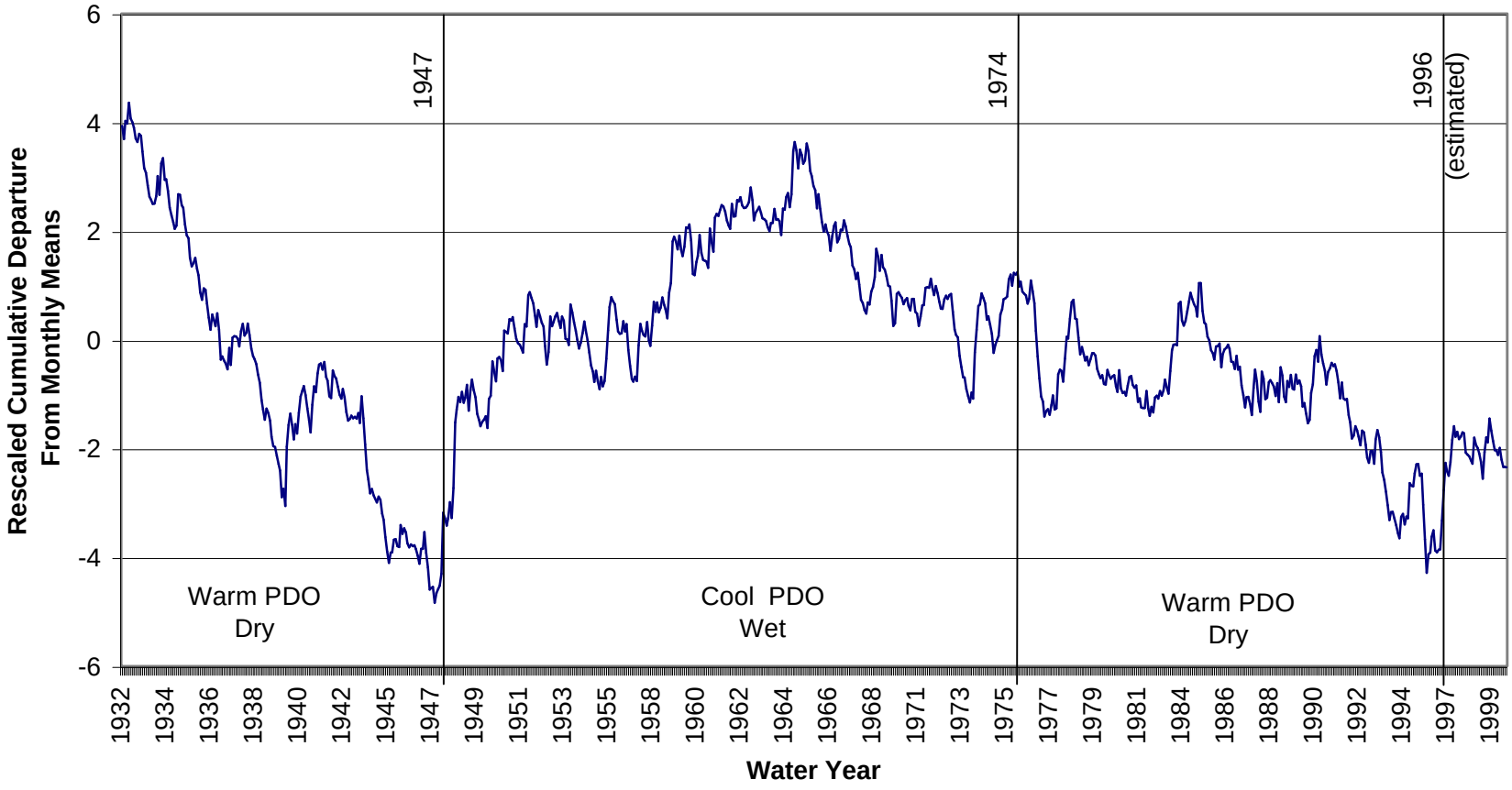
Mean Monthly Temperature

Spokane County

Watershed Assessment

013-1392, tables for rpt.xls, 07/25/2001

Golder Associates



Legend

Precipitation, Base Period 1937-1976

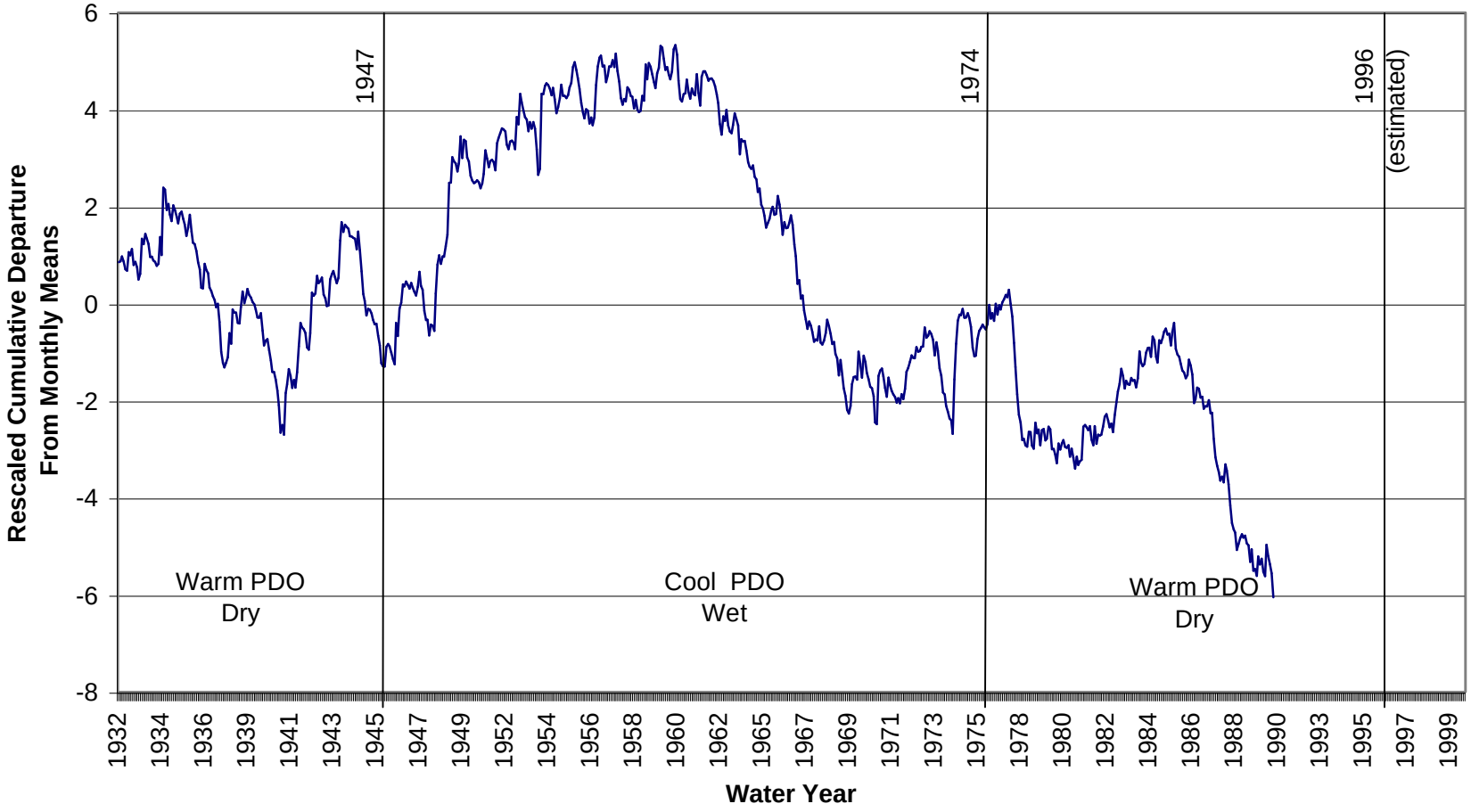
POR 1889 - 1999.
NOTE: Gage location varies

FIGURE 4.10a: Cumulative Departure Trends, Spokane International AP (stn 457938)

Spokane County
Watershed Inventory Assesment

013-1372, 07/23/01, id457938graphs.xls

Golder Associates



Legend

Precipitation, Base Period 1937-1976

POR 1893 - 1990.
NOTE: Gage location varies

FIGURE 4.10b: Cumulative Departure Trends, Colfax 1 NW

Spokane County
Watershed Assesment

013-1372, 07/23/01, id457938graphs.xls

Golder Associates

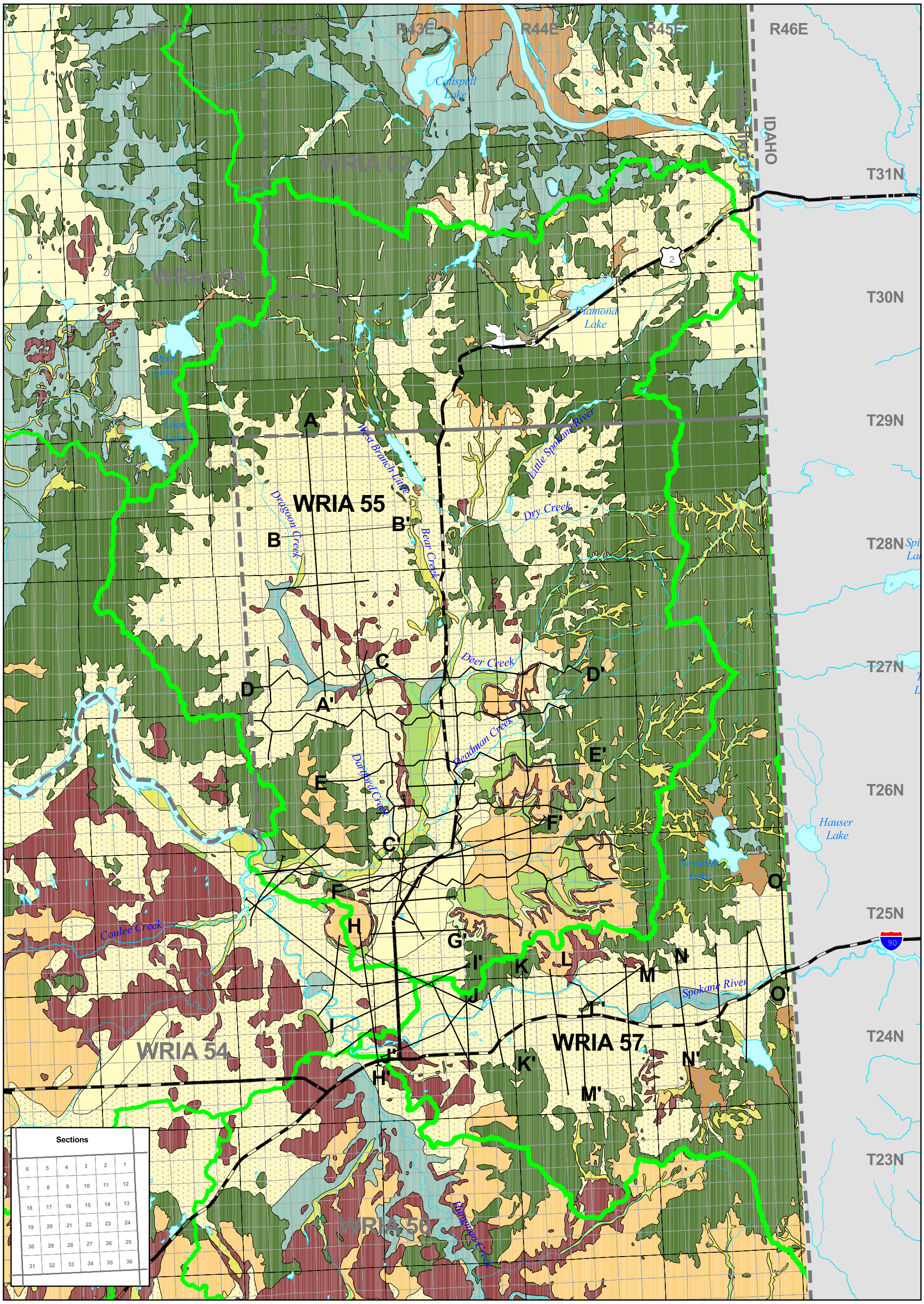
QUATERNARY	RECENT	Present to 12,000 years	ALLUVIUM (Qal) Stratified clay, silt, sand and gravel. Reworked glacial flood deposits (Qfs/Qfg/Qfcg) and loess (Ql).	MASS WASTING DEPOSITS (Qmw) Landslide debris with lesser amounts of debris-flow and rockfall deposits. Deposits range in age from time of glacial floods to the present.
			LACUSTRINE DEPOSITS (Qal) Fine sand, silt, clay and peat in post-glacial lakes.	
			ALLUVIAL FAN DEPOSITS (Qal) Gravel, sand and silt where steep drainages enter lower gradient and larger drainages.	
	PLEISTOCENE	12,000 to 2 million years	LOESS (Ql) Unstratified silt and clay with little fine sand and volcanic ash.	
			GLACIAL FLOOD DEPOSITS, PREDOMINANTLY SAND (Qfs) Poorly to well sorted, bedded and massive, fine to coarse sand with trace cobbles and boulders.	GLACIAL LAKE DEPOSITS (Qgl) Massive and bedded, fine sand and silt. May be interbedded with sand and gravel flood deposits.
			GLACIAL FLOOD DEPOSITS, PREDOMINANTLY GRAVEL (Qfs) Poorly to well sorted, matrix and clast supported, bedded and massive, sand, cobbles and boulders.	
			GLACIAL FLOOD-CHANNEL DEPOSITS, PREDOMINANTLY GRAVEL (Qfs) Poorly to well sorted, matrix and clast supported, bedded and massive, sand, cobbles and boulders.	
MIOCENE		5 to 24 million years	WANAPUM BASALT, PRIEST RAPIDS MEMBER (Tw) Dark gray to black, fine grained basalt.	LATAH FORMATION (Tl) Finely laminated siltstone, claystone and minor sandstone.
			GRANDE RONDE BASALT (Tgr) Dark gray to black, fine grained basalt.	
EOCENE TO LATE CRETACEOUS		38 to 100 million years	IGNEOUS BASEMENT (B) Coarse grained quartz monzonite to granodiorite.	
CAMBRIAN AND PRECAMBRIAN		500 to 16,00 million years	METAMORPHIC BASEMENT (B) Quartzite, argillite, schist and gneiss.	

SOURCE: Washington State Department of Natural Resources (2001)

FIGURE 4.11
GENERALIZED STRATIGRAPHY
SPOKANE COUNTY/LEVEL I ASSESSMENT/WA

PROJECT NO. 013 1372_1700 DRAWING NO. 96609 DATE 11/12/01 DRAWN BY EL

Golder Associates



Legend

- WRIA Boundaries
- Townships
- Sections
- Rivers and Streams
- Roads
- Cross Sections
- County Boundaries

Qal	Alluvium
Qp/Qla	Peat / Lake Deposits
Qmn	Mass Wasting Deposits
QL	Loess
Qfg	Flood Deposits, Gravel
Qfs	Flood Deposits, Sand
Qs	Sedimentary Deposits, Undivided
Qgd	Glacial Deposits
TL	Latah
TW/Tgr	Basalt
B	Crystalline Basement

N

0 4

Scale 1" = 4 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

Original Data Source: Washington State DNR, Department of Ecology; USGS; Emcon (1992), Boere & Buchanan, (1996), CH2MHill (1998)

This figure was originally produced in color. Reproduction in black and white may result in loss of information.

Golder Associates

Surficial Geology

Drawn: GKL	App'd:	Date: June 16, 2003	Figure: 4.12

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STRATIGRAPHY

QUATERNARY UNCONSOLIDATED UNITS

Qal/Qaf:	ALLUVIUM
Qmw:	MASS WASTING DEPOSITS
Ql:	LOESS
Qfg:	FLOOD GRAVELS
Qfs:	FLOOD SANDS
Qfcg:	FLOOD CHANNEL GRAVELS
Qgl:	GLACIAL LAKE DEPOSITS
Qs:	UNDIFFERENTIAL QUATERNARY SEDIMENTS

TERTIARY UNITS

Tw:	WANAPUM BASALT
Tl:	LATAH SEDIMENTS
Tgr:	GRANDE RONDE BASALT

PALAEOZOIC TO PRECAMBRIAN UNITS

B:	CRYSTALLINE BASEMENT

WELL INFORMATION

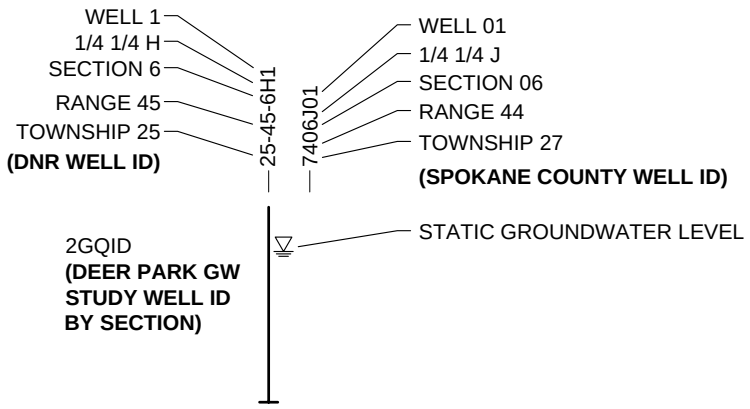
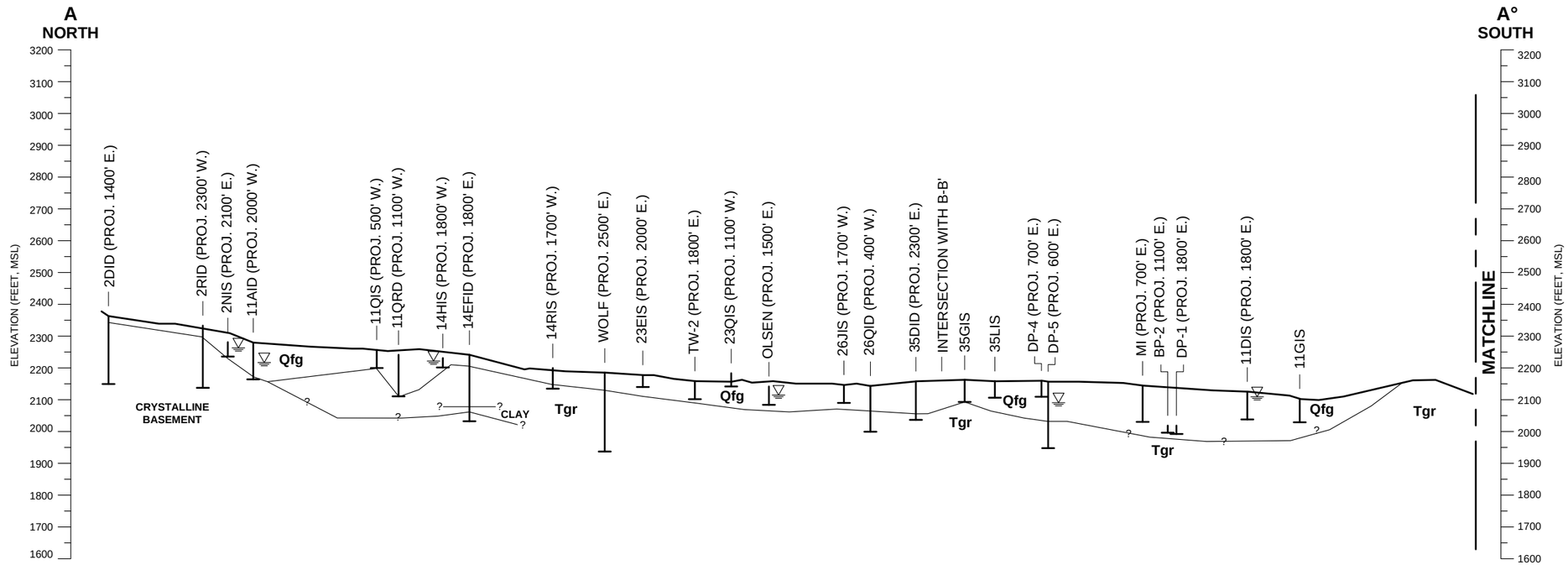
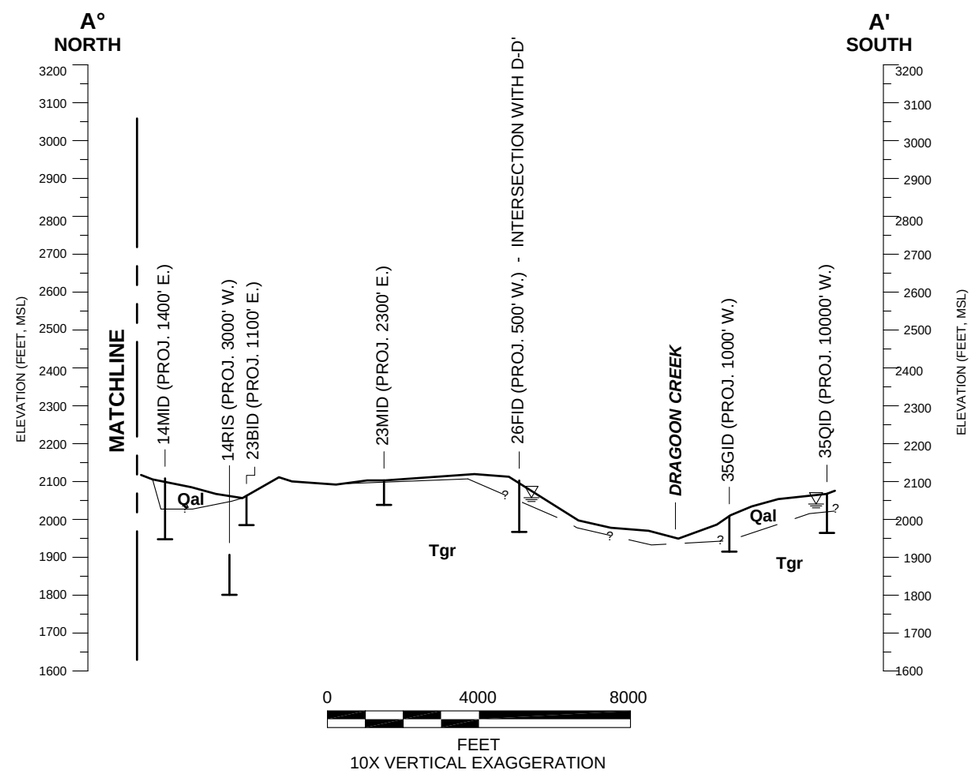


FIGURE **4.13**

LEGEND FOR GEOLOGIC CROSS-SECTIONS

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA





SEE FIGURE 4.14 FOR LEGEND.

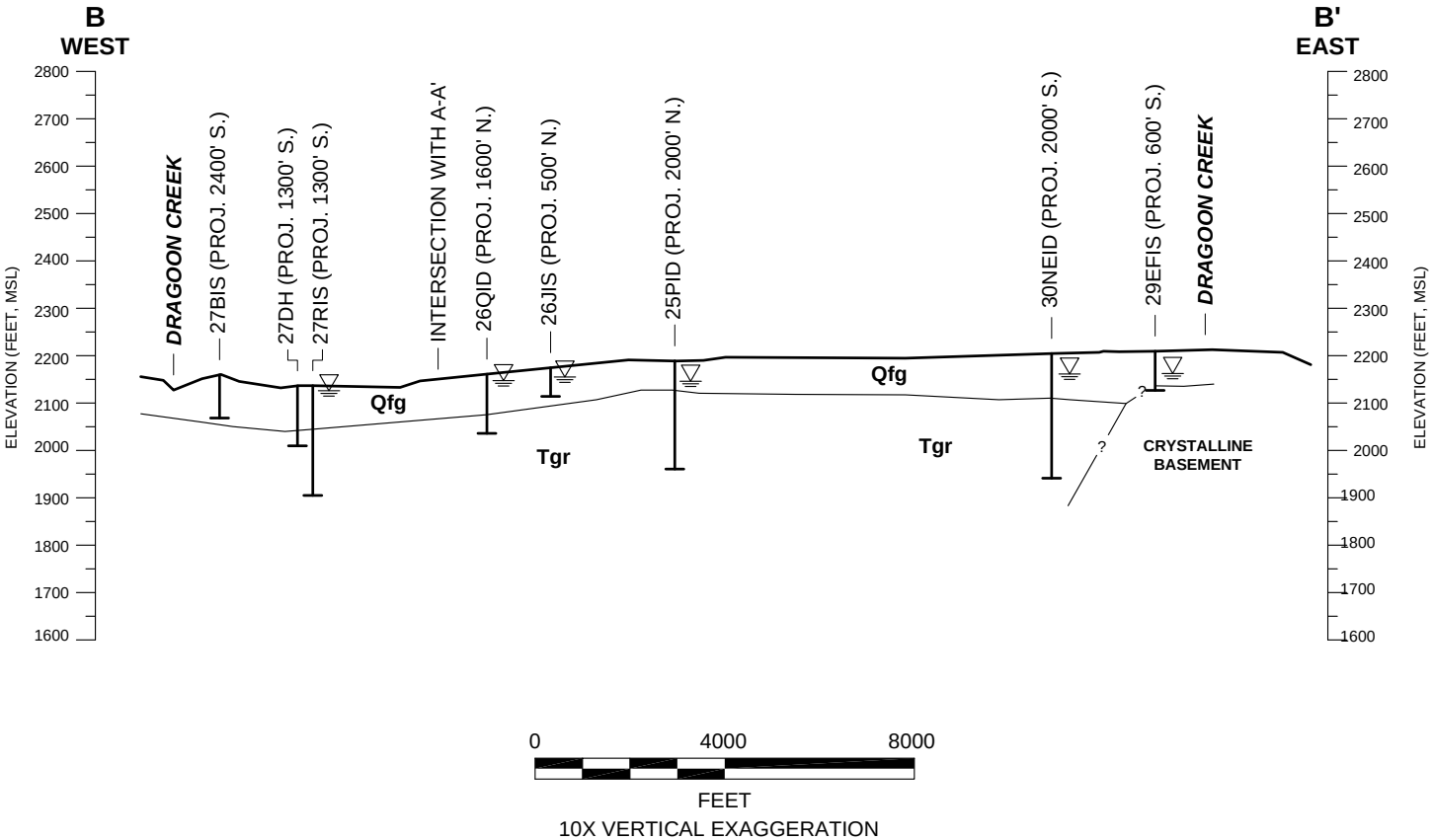
SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: DEER PARK GROUNDWATER MANAGEMENT CHARACTERIZATION STUDY (EMCON, 1992), SECTION C-C'.

FIGURE **4.14A**

CROSS-SECTION A-A'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA



SEE FIGURE 4.14 FOR LEGEND.

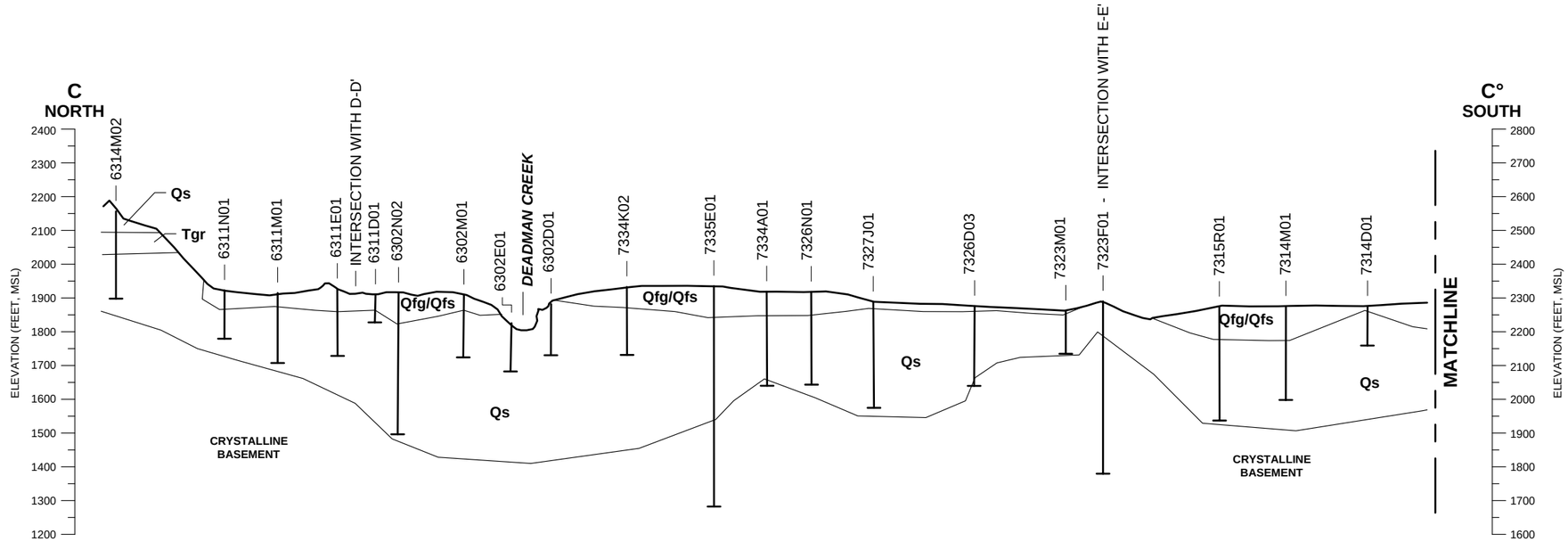
SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

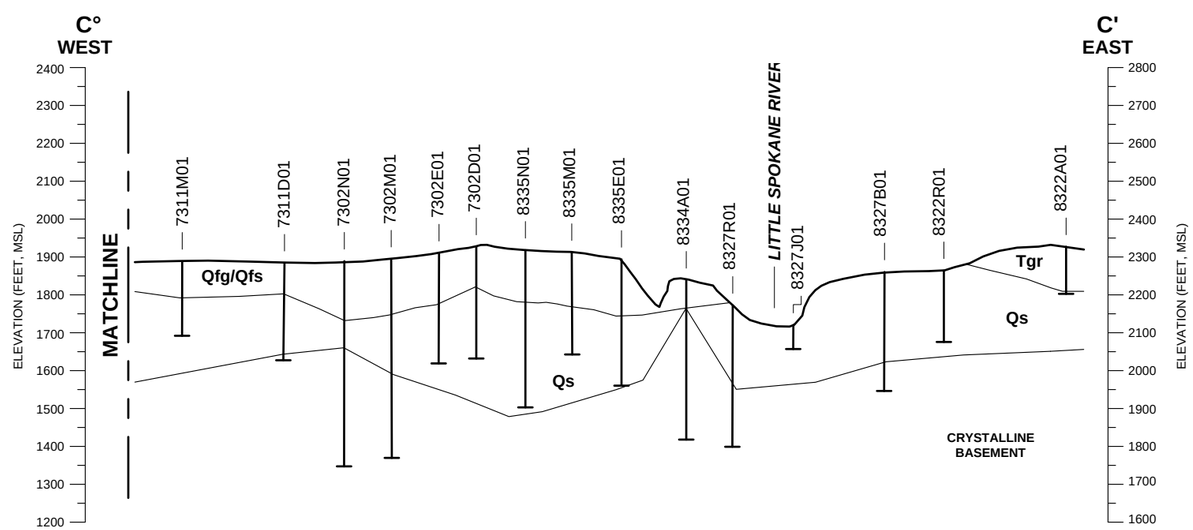
DATA SOURCE: DEER PARK GROUNDWATER MANAGEMENT CHARACTERIZATION STUDY (EMCON, 1992), SECTION B-B'.

FIGURE **4.14B**

CROSS-SECTION B-B'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA





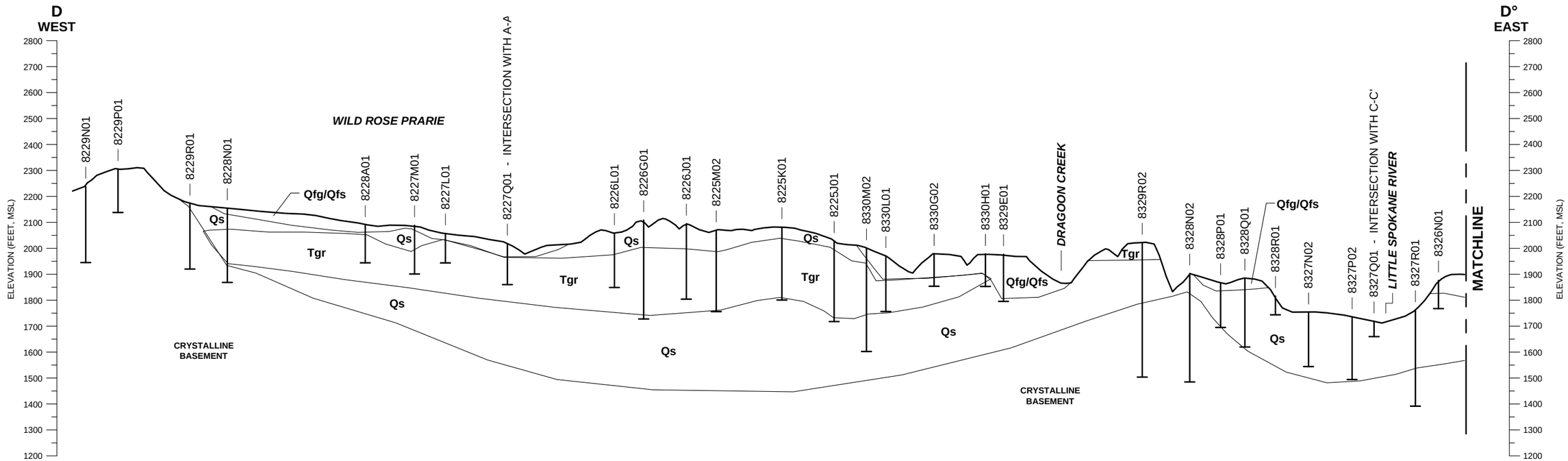
SEE FIGURE 4.14 FOR LEGEND.

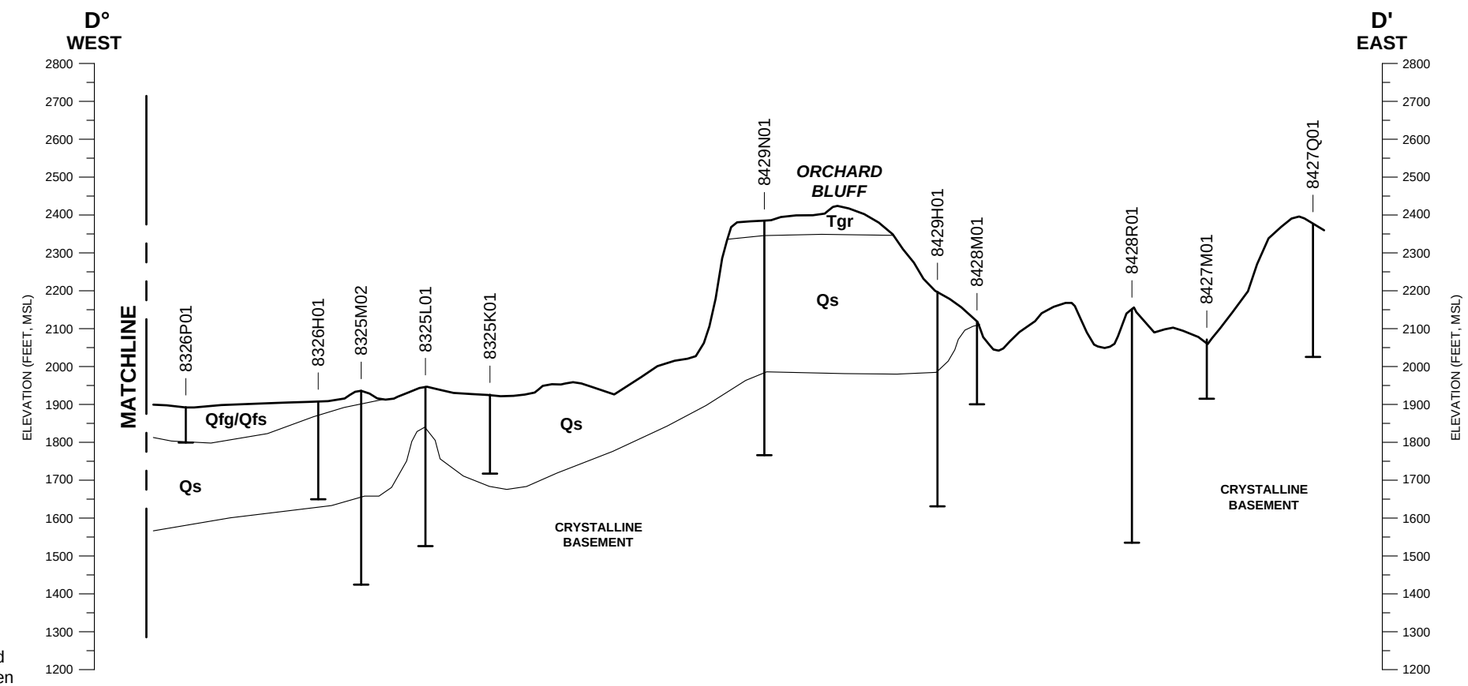
SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: AQUIFER DELINEATION OF A PORTION OF NORTH SPOKANE COUNTY (BOESE AND BUCHANAN, 1996), SECTION H-H'.

0 4000 8000
FEET
10X VERTICAL EXAGGERATION

FIGURE **4.14C**
CROSS-SECTION C-C'
SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA





SEE FIGURE 4.14 FOR LEGEND.

SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: AQUIFER DELINEATION OF A PORTION OF NORTH SPOKANE COUNTY (BOESE AND BUCHANAN, 1996), SECTION A-A'.

0 4000 8000
FEET
10X VERTICAL EXAGGERATION

FIGURE **4.14D**
CROSS-SECTION D-D'
SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA

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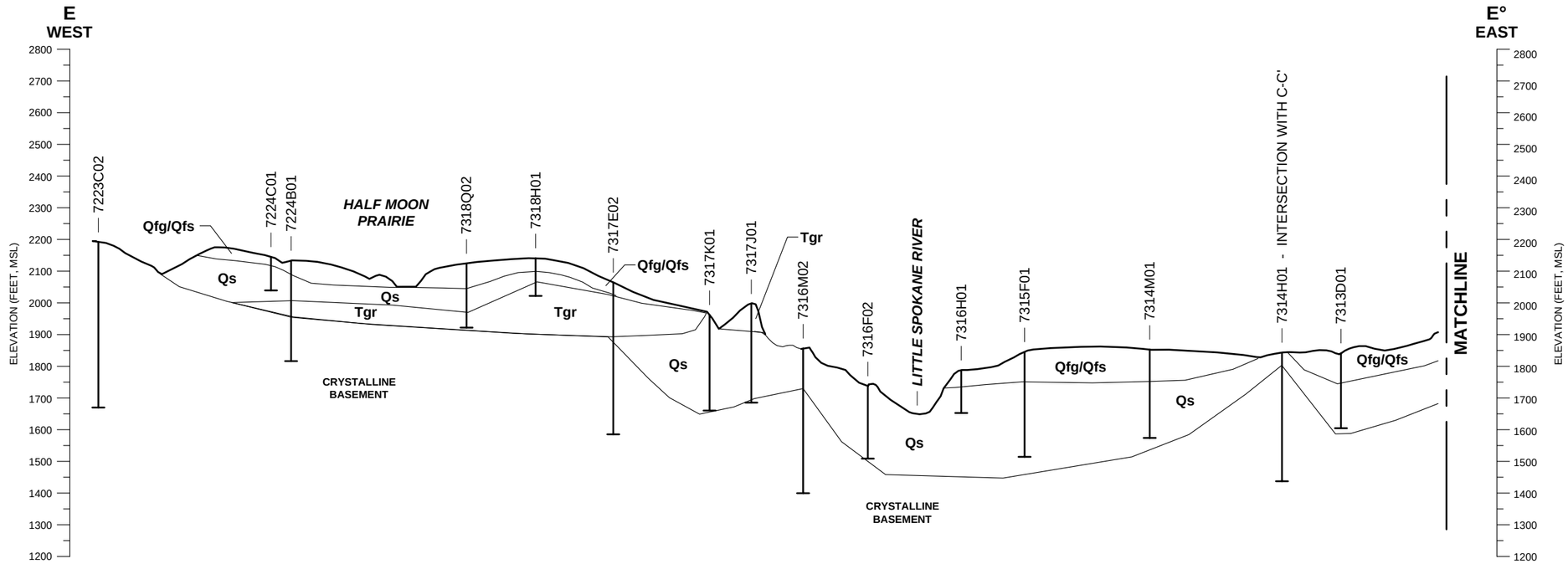
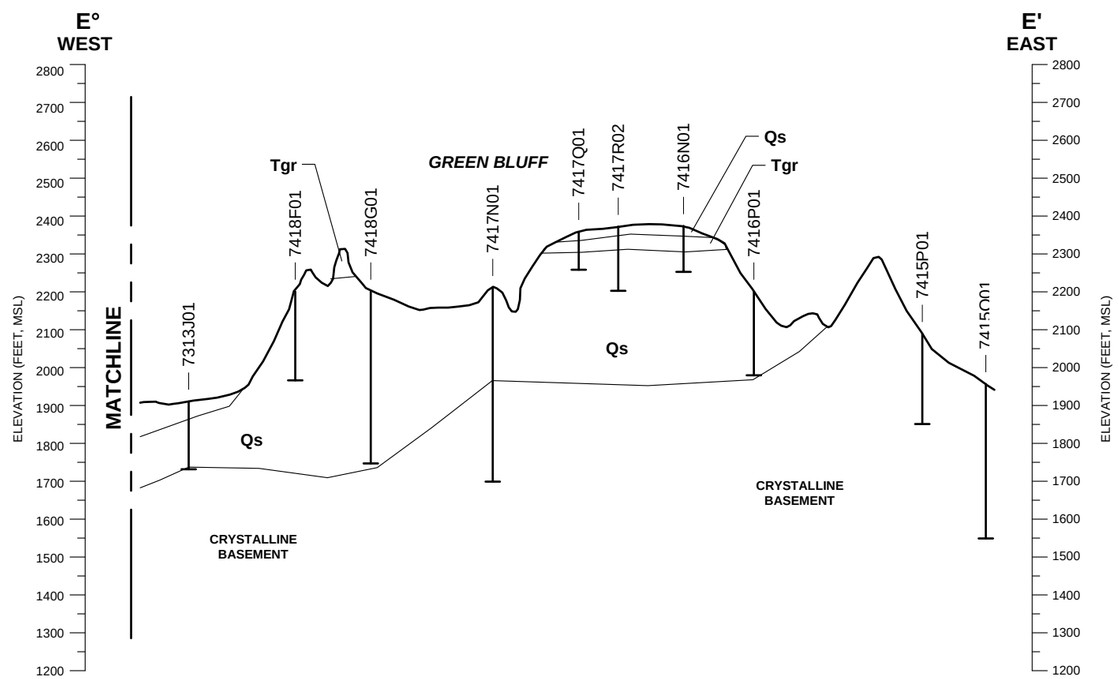
Golder Associates





SEE FIGURE 4.14 FOR LEGEND.

SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

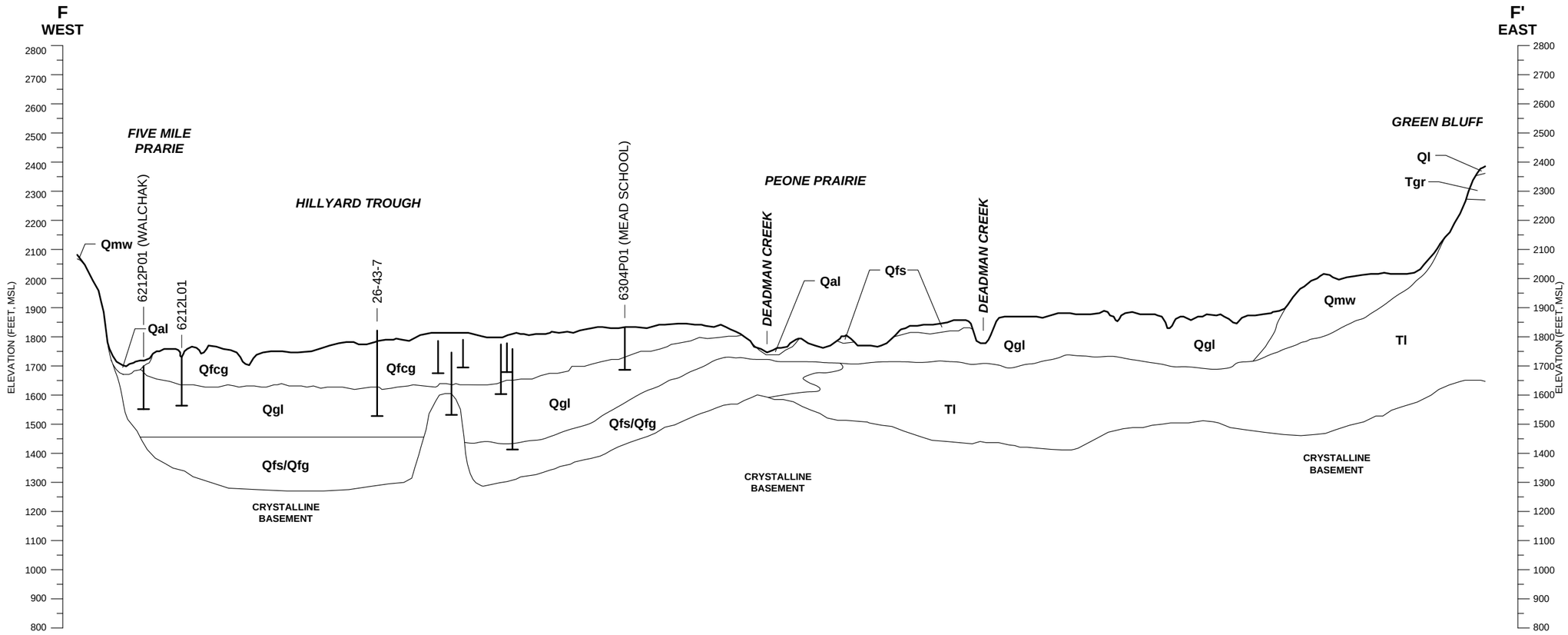
DATA SOURCE: AQUIFER DELINEATION OF A PORTION OF NORTH SPOKANE COUNTY (BOESE AND BUCHANAN, 1996), SECTION C-C'.

0 4000 8000
FEET
10X VERTICAL EXAGGERATION

FIGURE **4.14E**
CROSS-SECTION E-E'
SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA

K:\CAD\Projects\2001\0131372\1700\96115.dwg 01/15/2004, 07:44 Layout: Layout1

Golder Associates



0 4000 8000

FEET

10X VERTICAL EXAGGERATION

SEE FIGURE 4.14 FOR LEGEND.

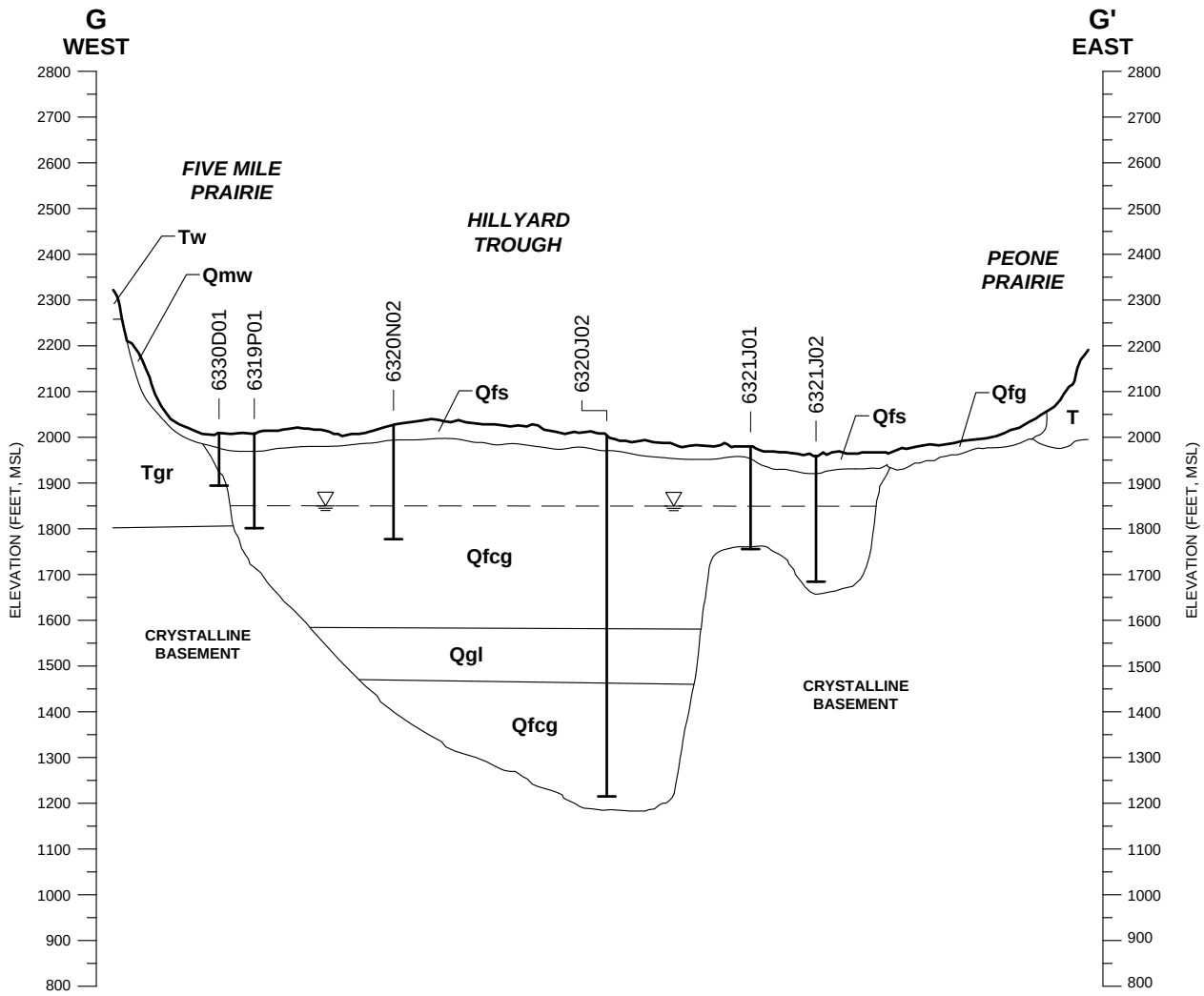
SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: DNR 2001 DRAFT SECTION Z-Z' BASED ON CH2MHILL (2000) MICROGRAVITY AND DNR MEAD GEOLOGY.

FIGURE **4.14F**

CROSS-SECTION F-F'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA



SEE FIGURE 4.14 FOR LEGEND.

SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: DNR 2001 DRAFT SECTION V-V' BASED ON DNR MAGNESIUM ROAD SEISMIC WELL LOG DATA. CH2MHILL (1998).

0 4000 8000
FEET
10X VERTICAL EXAGGERATION

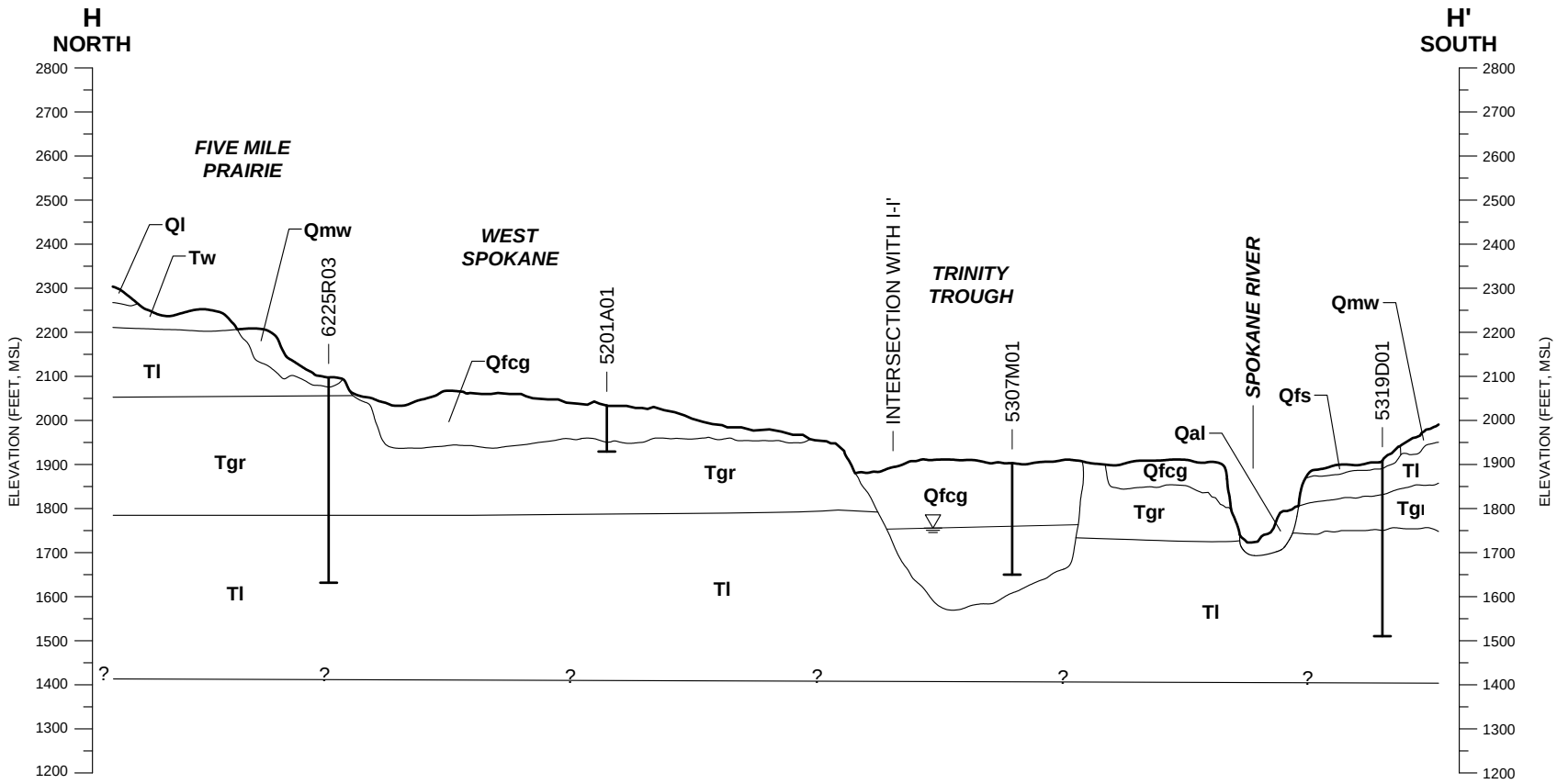
FIGURE **4.14G**

CROSS-SECTION G-G'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA

K:\CAD\Projects\2001\0131372\1700\96117.dwg 01/15/2004, 07:49 Layout: Layout1

Golder Associates



SEE FIGURE 4.14 FOR LEGEND.

SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

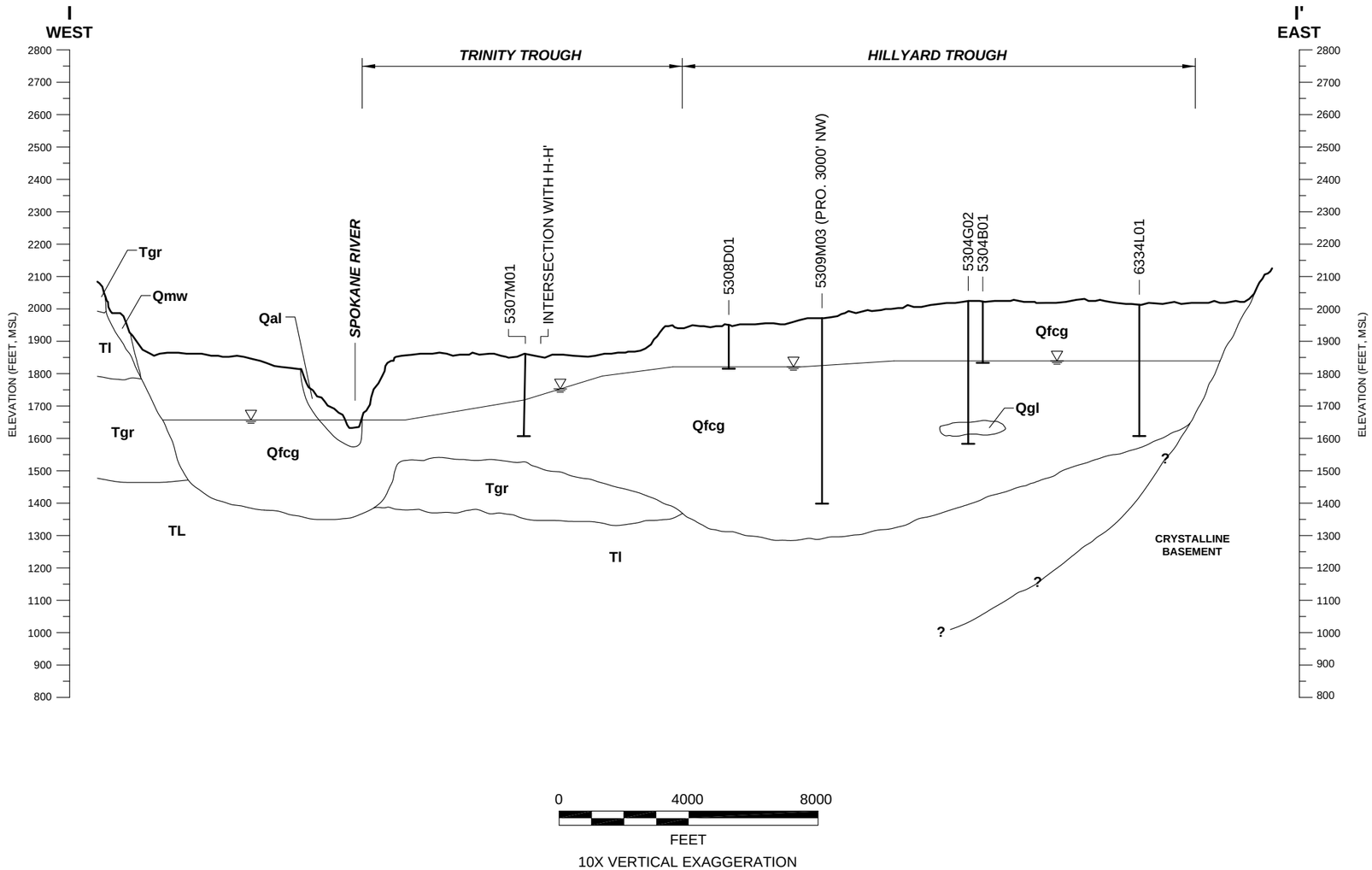
DATA SOURCE: DNR 2001 DRAFT SECTION R-R' BASED ON CH2MHILL (1998) WELL LOG DATA AND TRINITY TROUGH SEISMIC.

0 4000 8000
FEET
10X VERTICAL EXAGGERATION

FIGURE **4.14H**

CROSS-SECTION H-H'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA



SEE FIGURE 4.14 FOR LEGEND.

SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

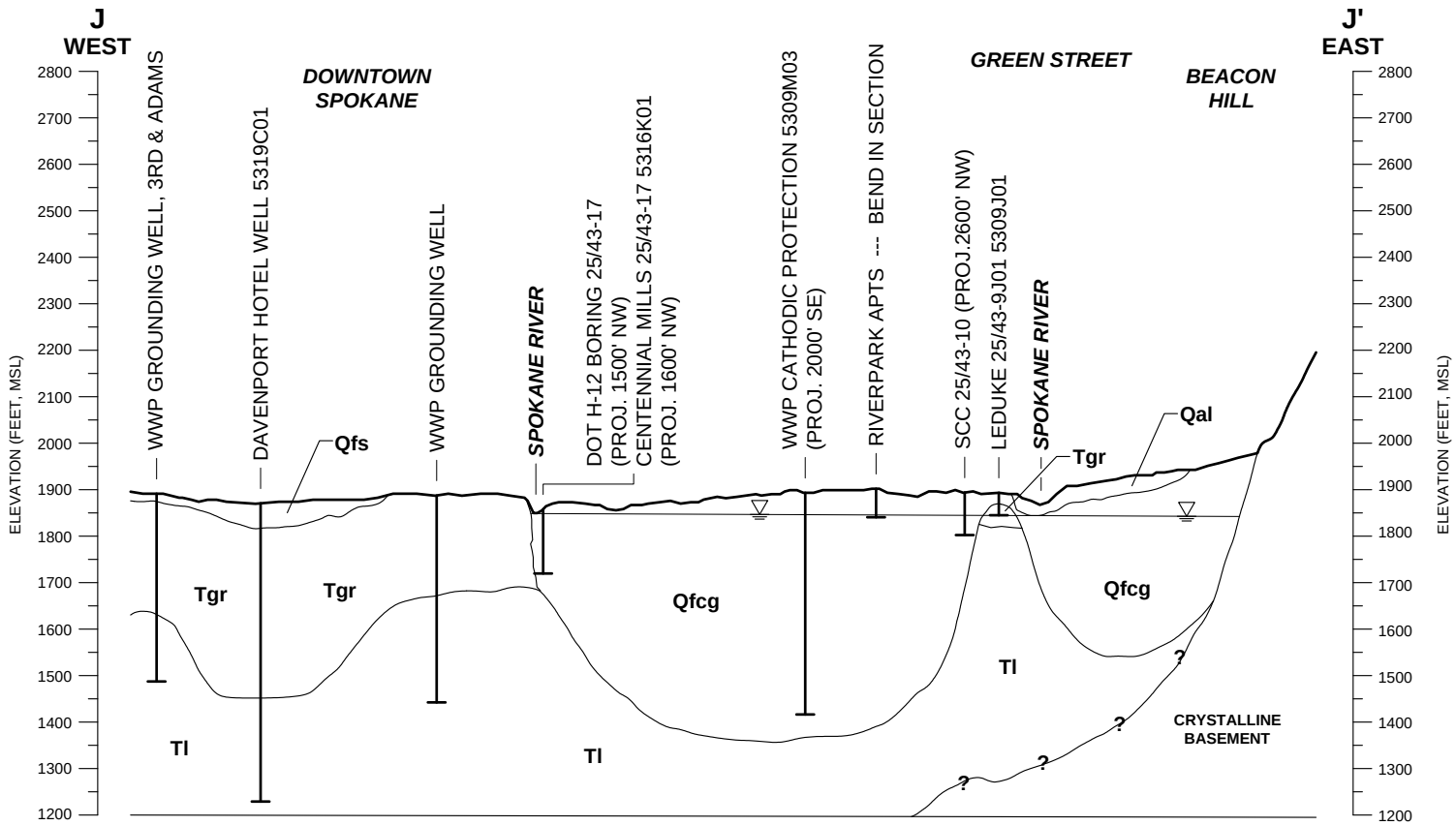
DATA SOURCE: DNR 2001 DRAFT SECTION Q-Q' BASED ON CH2MHILL (1998) MEENACH AND YORK SEISMIC WELL LOG DATA.

FIGURE **4.14I**

CROSS-SECTION I-I'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA

Golder Associates



0 4000 8000

FEET

10X VERTICAL EXAGGERATION

SEE FIGURE 4.14 FOR LEGEND.

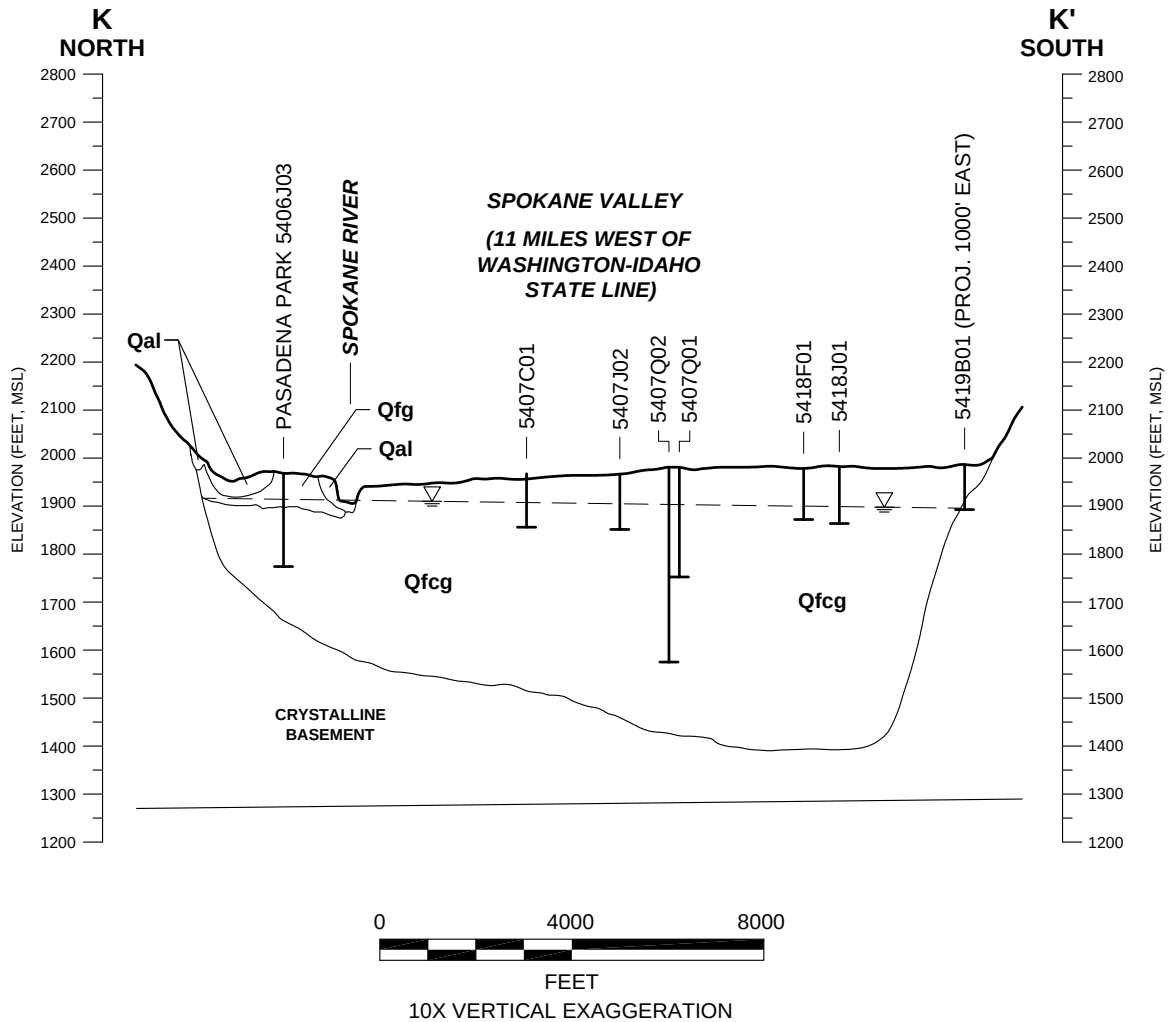
SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: DNR 2001 DRAFT SECTION O-O'
BASED ON WELL LOG DATA CH2MHILL (1998).

FIGURE **4.14J**

CROSS-SECTION J-J'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA



SEE FIGURE 4.14 FOR LEGEND.

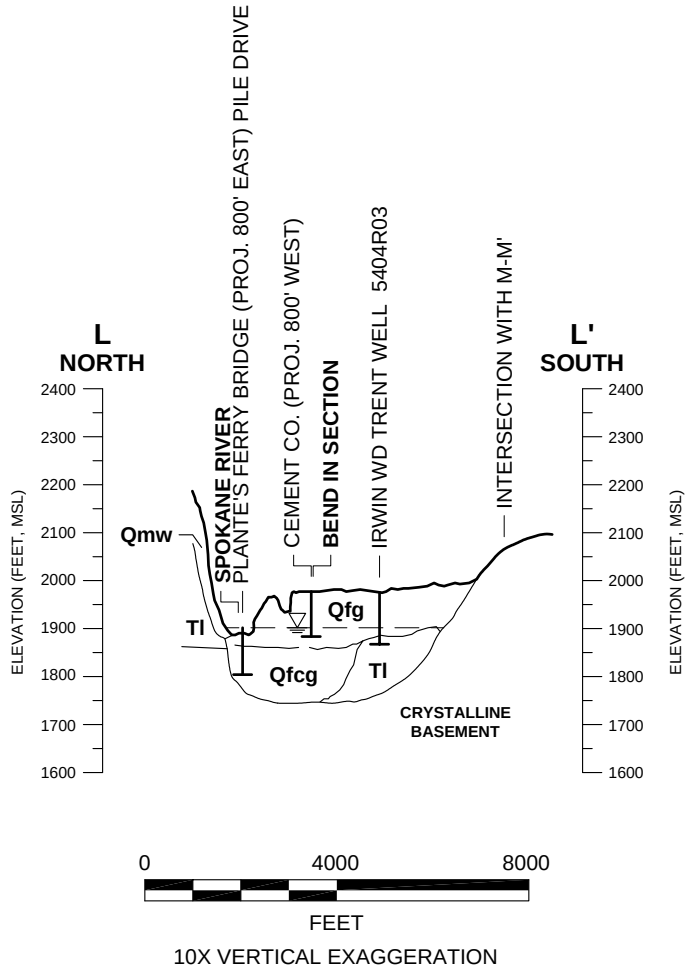
SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: DNR 2001 DRAFT SECTION K-K'
BASED ON CH2MHILL (1998) VISTA ROAD SEISMIC.

FIGURE **4.14K**

CROSS-SECTION K-K'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA



SEE FIGURE 4.14 FOR LEGEND.

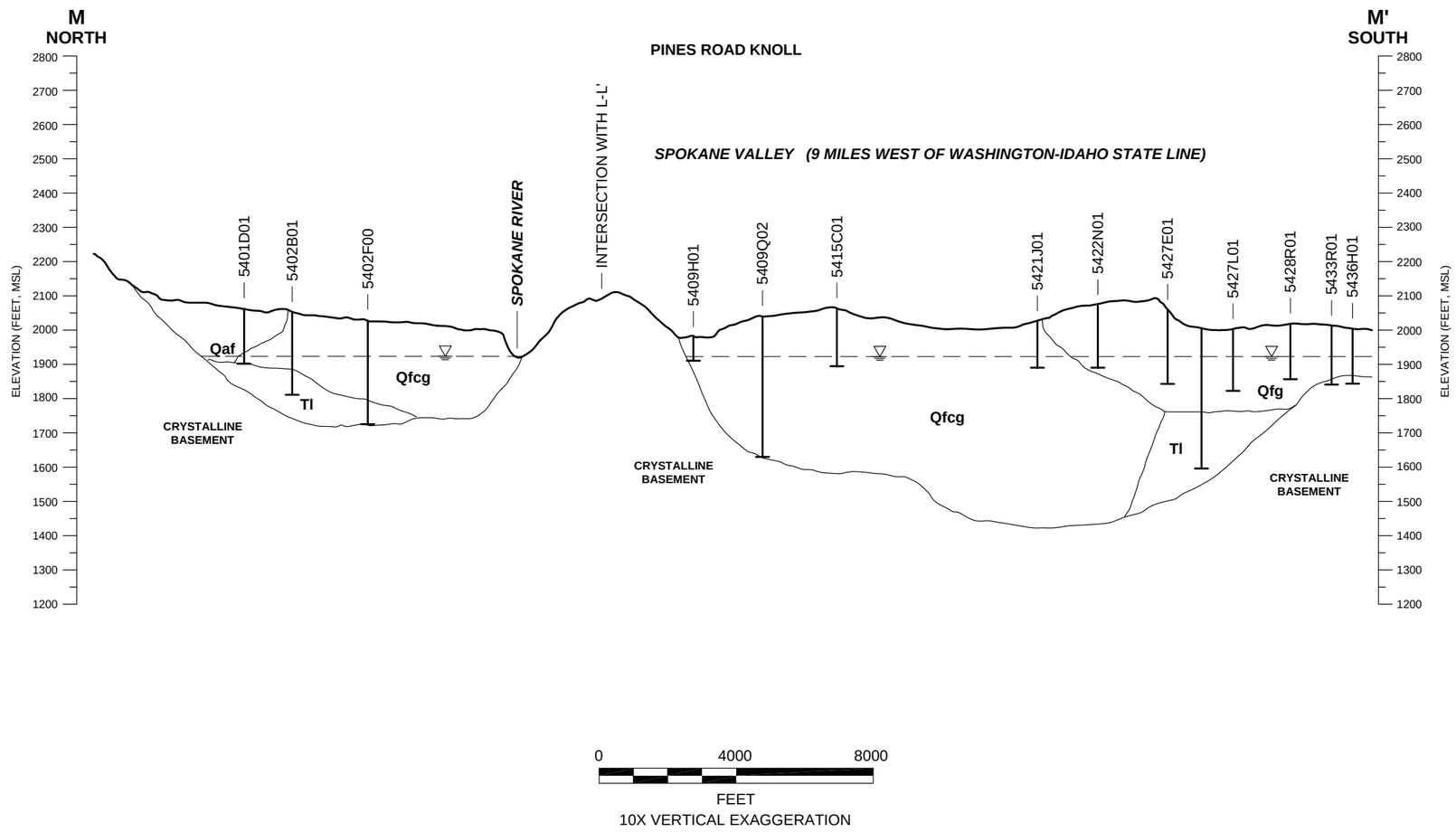
SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: DNR 2001 DRAFT SECTION I-I'
BASED ON WELL LOG DATA CH2MHILL (1998).

FIGURE **4.14L**

CROSS-SECTION L-L'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA



SEE FIGURE 4.14 FOR LEGEND

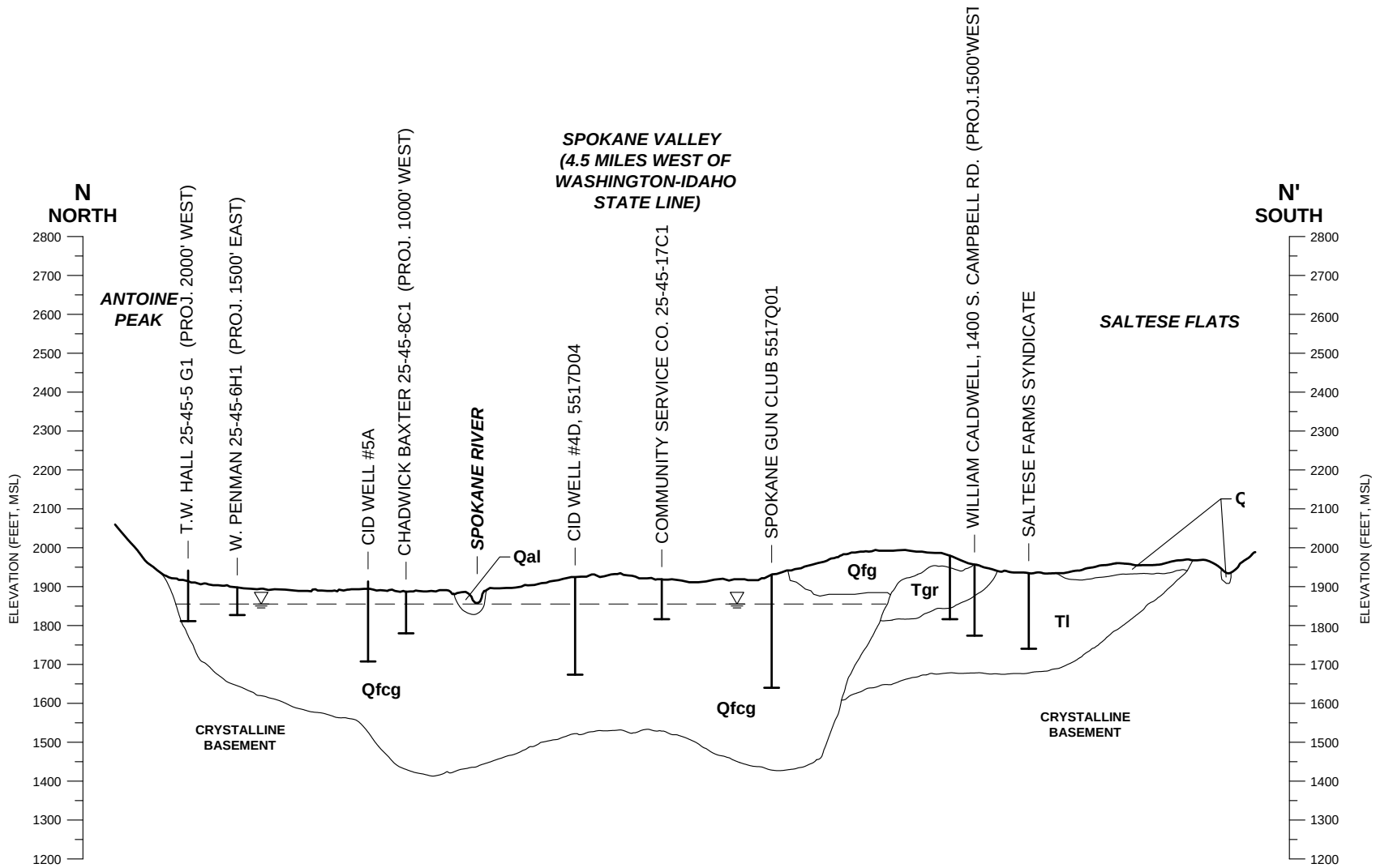
SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: DNR 2001 DRAFT SECTION H-H'
BASED ON WELL LOG DATA CH2MHILL (1998).

FIGURE **4.14M**

CROSS-SECTION M-M'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA



SEE FIGURE 4.14 FOR LEGEND.

SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: DNR 2001 DRAFT SECTION F-F' BASED ON WELL LOG DATA AND REGIONAL GEOLOGY.

0 4000 8000
FEET
10X VERTICAL EXAGGERATION

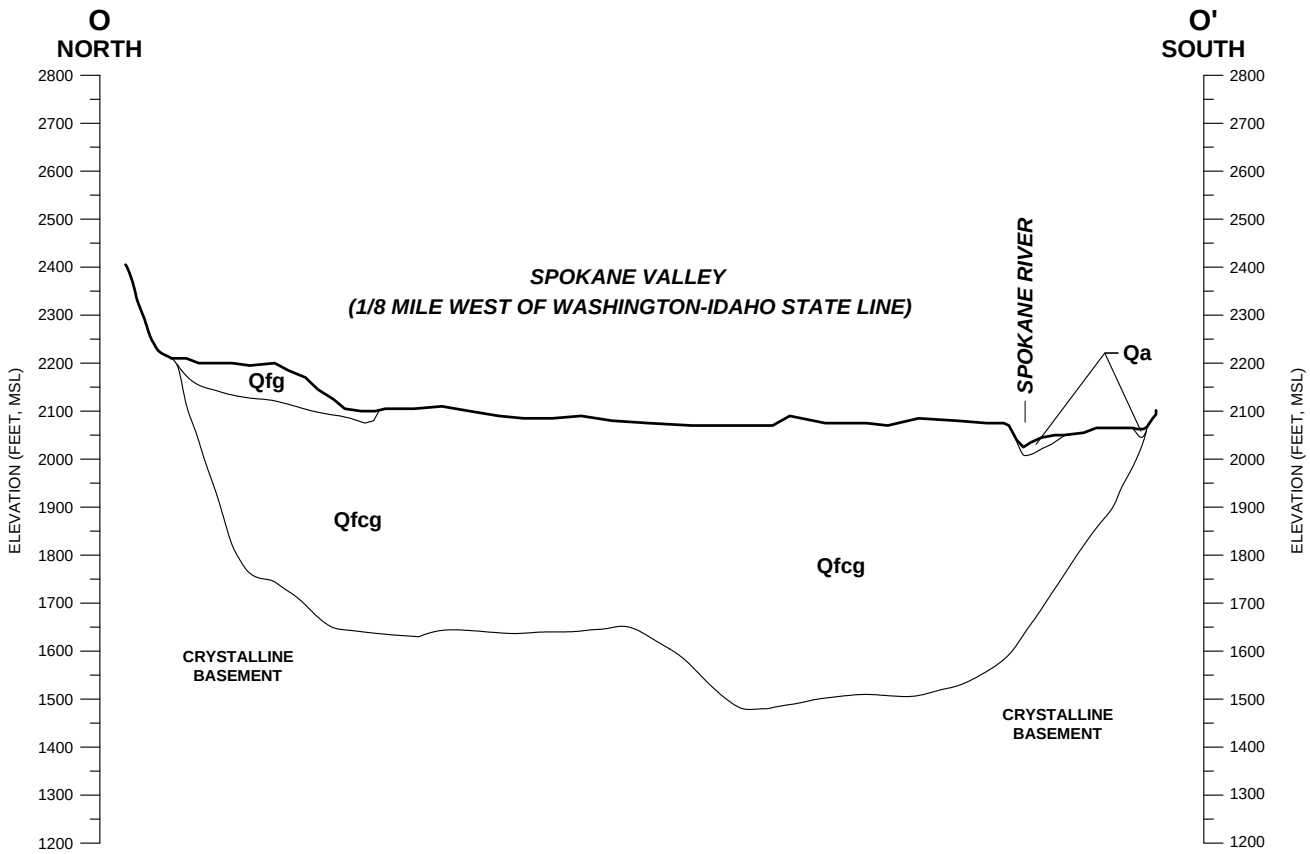
FIGURE **4.14N**

CROSS-SECTION N-N'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA

K:\CAD\Projects\2001\0131372\1700\96124.dwg 01/15/2004, 07:55 Layout: Layout1

Golder Associates



0 4000 8000

FEET

10X VERTICAL EXAGGERATION

SEE FIGURE 4.14 FOR LEGEND.

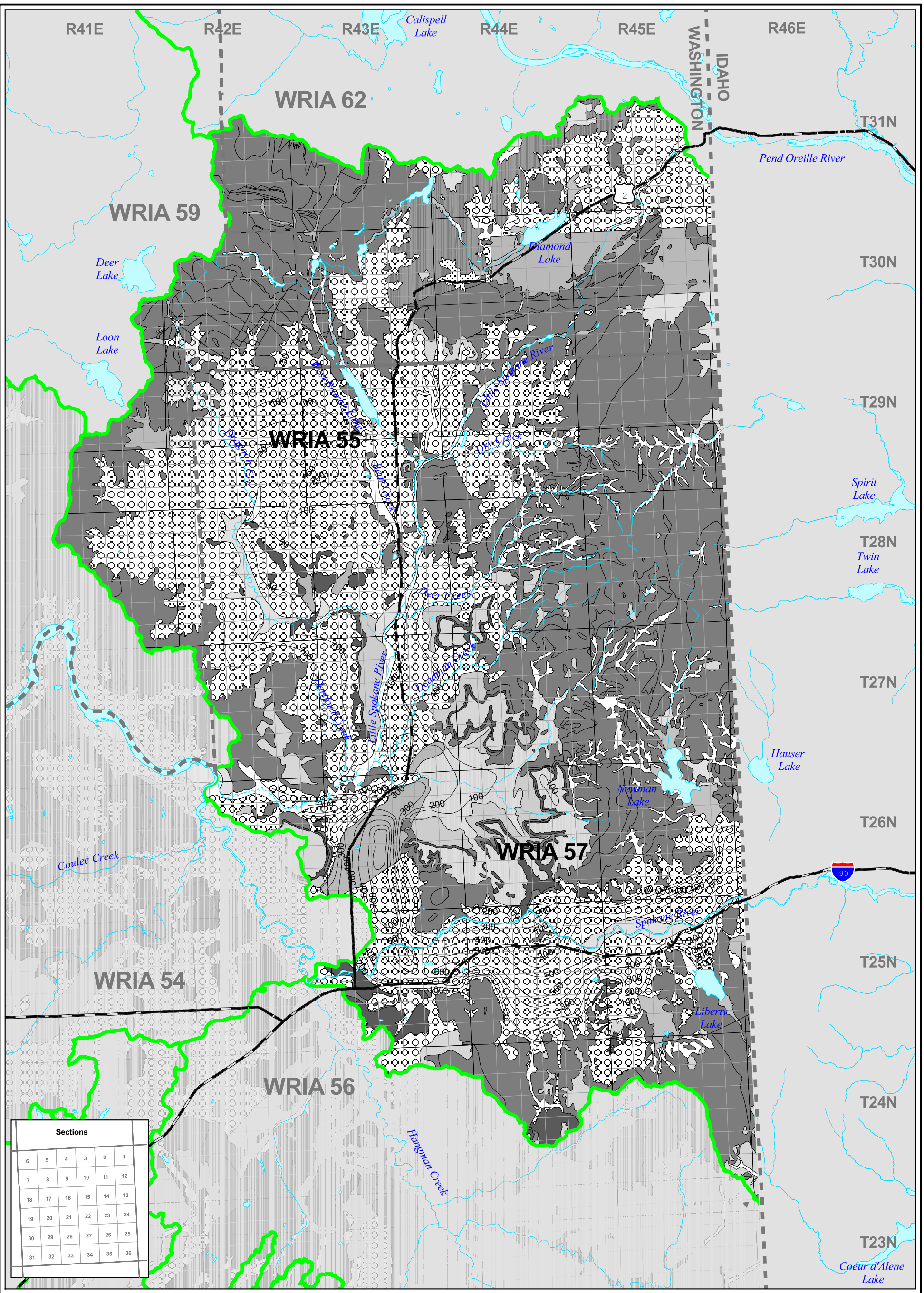
SPECIAL NOTE:
Data concerning the various strata have been obtained at exploration locations only. The interpretation between these locations has been inferred from geological evidence and so may vary from that shown.

DATA SOURCE: DNR 2001 DRAFT SECTION B-B' BASED ON DNR (1994) UNPUBLISHED SEISMIC AND PURVES (1969) GRAVITY DATA.

FIGURE **4.14O**

CROSS-SECTION O-O'

SPOKANE COUNTY/LEVEL 1 ASSESSMENT/WA



Legend

- WRIA Boundaries
- Townships
- Sections
- Rivers and Streams
- Roads
- County Boundaries
- ---500--- Approximate Unconsolidated Deposit Thickness Contour (feet)

Geologic Units

Qal	Alluvium
Qp/Qla	Peat / Lake Deposits
Qmw	Mass Wasting Deposits
Ql	Loess
Qfg	Flood Deposits, Gravel
Qfs	Flood Deposits, Sand
Qs	Sedimentary Deposits, Undivided
Qgd	Glacial Deposits
Tl	Latah
Tw/Tgr	Basalt
B	Crystalline Basement

N

0 4

Scale 1" = 4 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

Original Data Source: Washington State DNR, Department of Ecology, USGS, Emcon (1992), Boese & Buchanan (1996), CH2&Hill (2000)

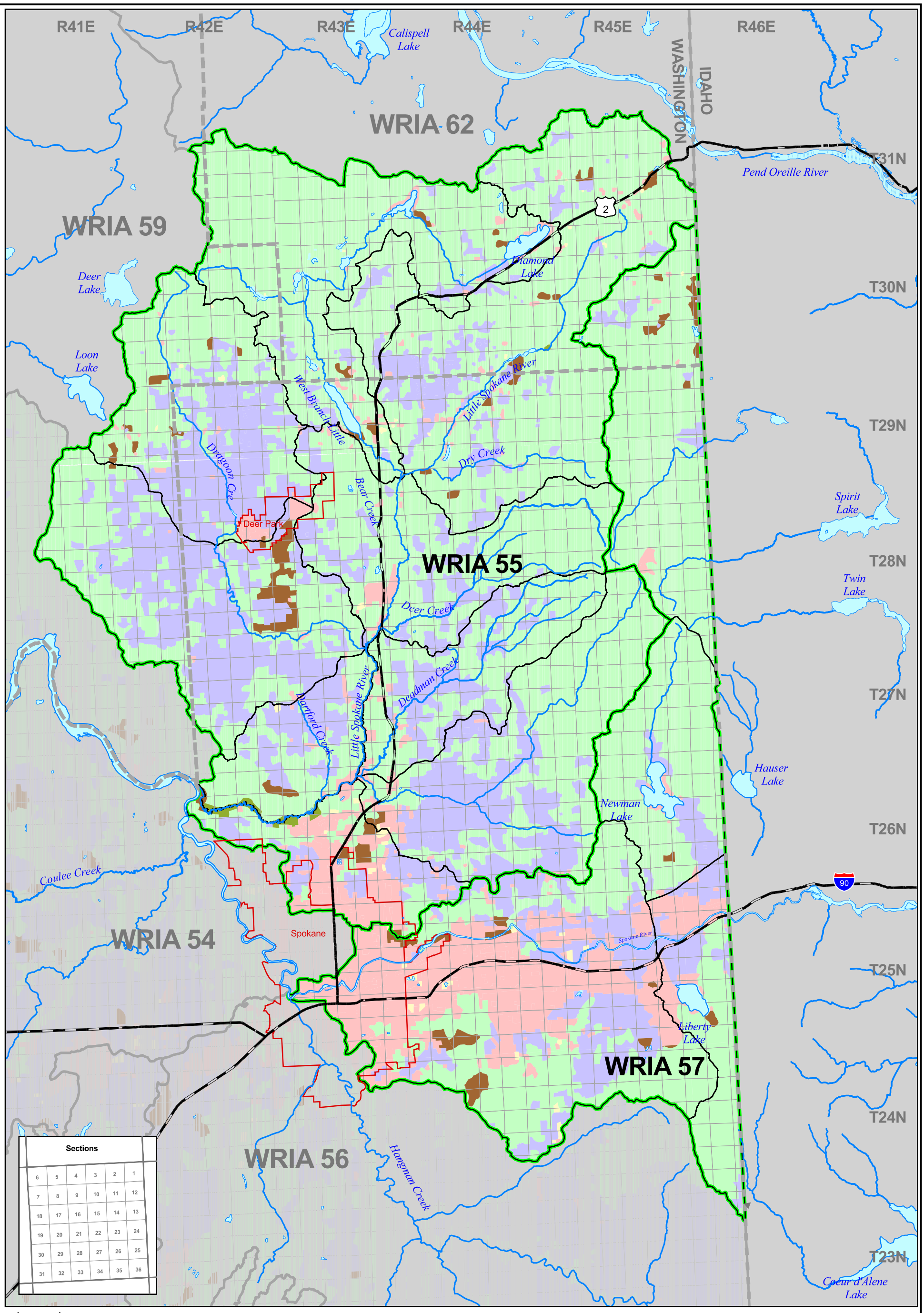
This figure was originally produced in color. Reproduction in black and white may result in loss of information.

Golder Associates

Thickness of Unconsolidated Deposits

Drawn: GKL	App'd:	Date: Oct 31, 2001	Figure: 4.15

L:\projects\2001\0131372\gis\aprs\overview.apr 10-31-01 GKL



Legend

- WRIA Boundaries
- WAU Boundaries
- Townships
- Sections
- City Limits
- County Boundaries
- Roads
- Rivers and Streams

Land Use/Land Cover

- Agricultural Land
- Barren Land
- Forest Land
- Rangeland
- Urban or Built-Up Land
- Water
- Wetland

N

0 4

Scale 1" = 4 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

Original Data Source: Washington Department of Ecology, USGS

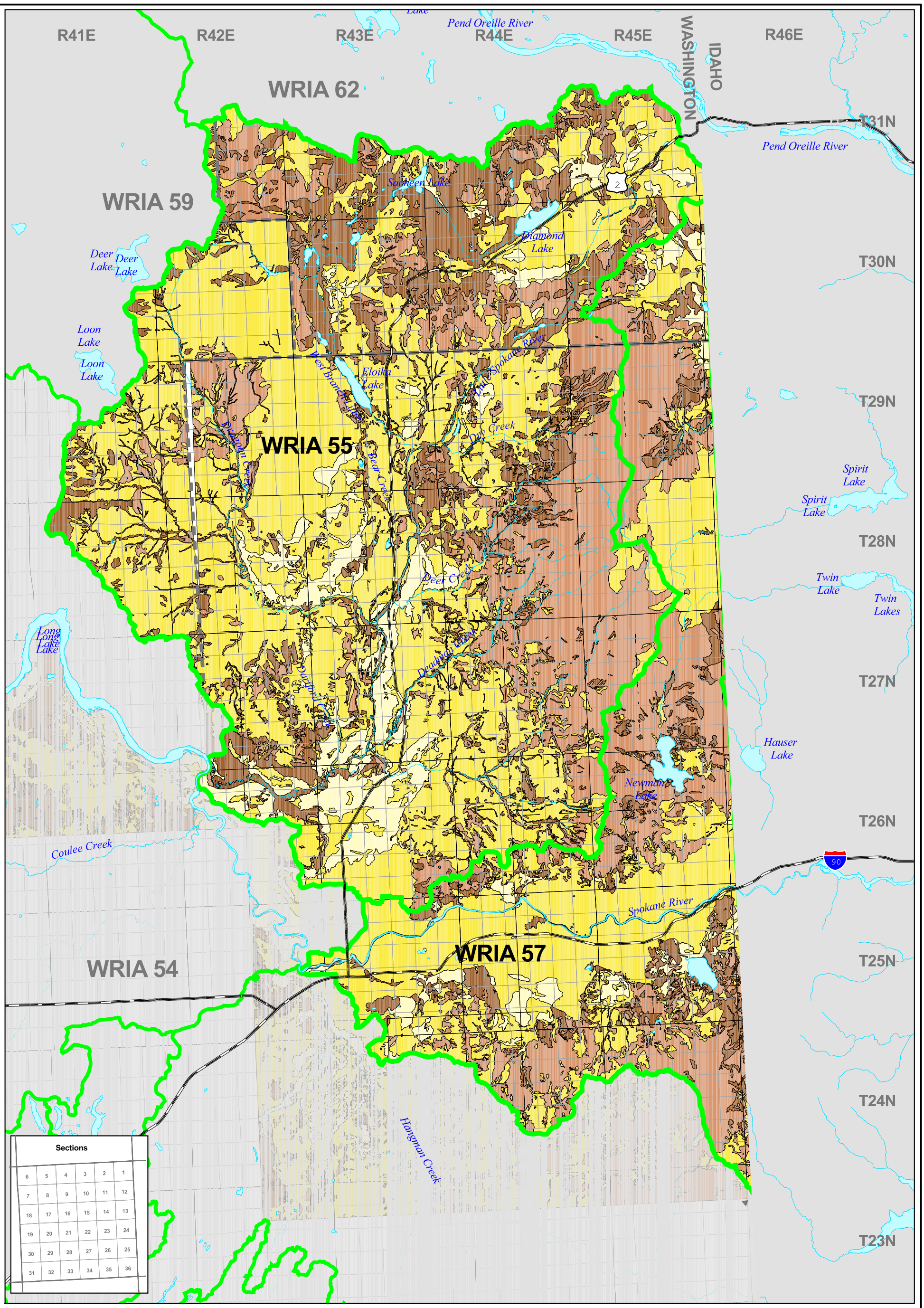
This figure was originally produced in color. Reproduction in black and white may result in loss of information.

Golder Associates

Land Use/Land Cover

Drawn: GKL	App'd:	Date: Oct. 31, 2001	Figure: 4.16

L:\projects\2001\0131372\gis\aprs\overview.apr 10-31-01 GKL



Legend

- WRIA Boundaries
- Townships
- Sections
- County Boundaries
- Rivers and Streams
- Roads

Soil Groups

- Low Run-off Potential
- Moderate Infiltration
- Low Infiltration
- High Run-off Potential

N

0 4

Scale 1" = 4 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

Original Data Source: Washington State DNR, Department of Ecology, USGS, National Resourc Conservation Service

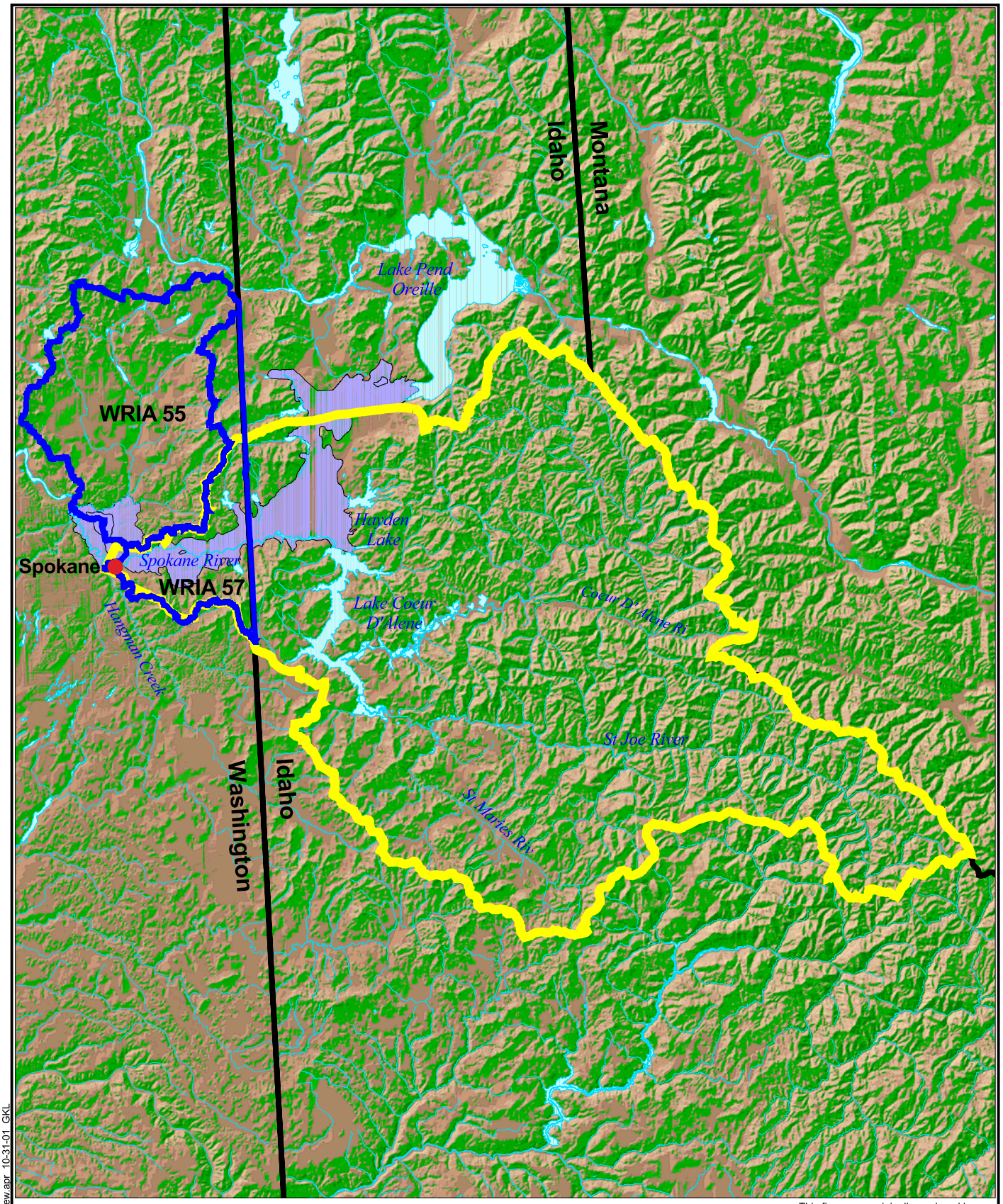
This figure was originally produced in color. Reproduction in black and white may result in loss of information.

Golder Associates

Spokane Soil Groups

Drawn: KAV	App'd:	Date: June 16, 2003	Figure: 4.17

L:\projects\ 2001\0131372\gis\aprs\overview.apr 10-31-01 GKL



Legend

- Wria Boundaries
- State Boundaries
- Streams and Rivers
- Watershed Boundary
- Spokane Vallley - Rathdrum Prairie Aquifer

N

0 18

Scale 1" = 18 Miles

Map Projection: Washington State Plane North Zone, NAD 83, Feet

Original Data Source: Washington Department of Ecology, USGS

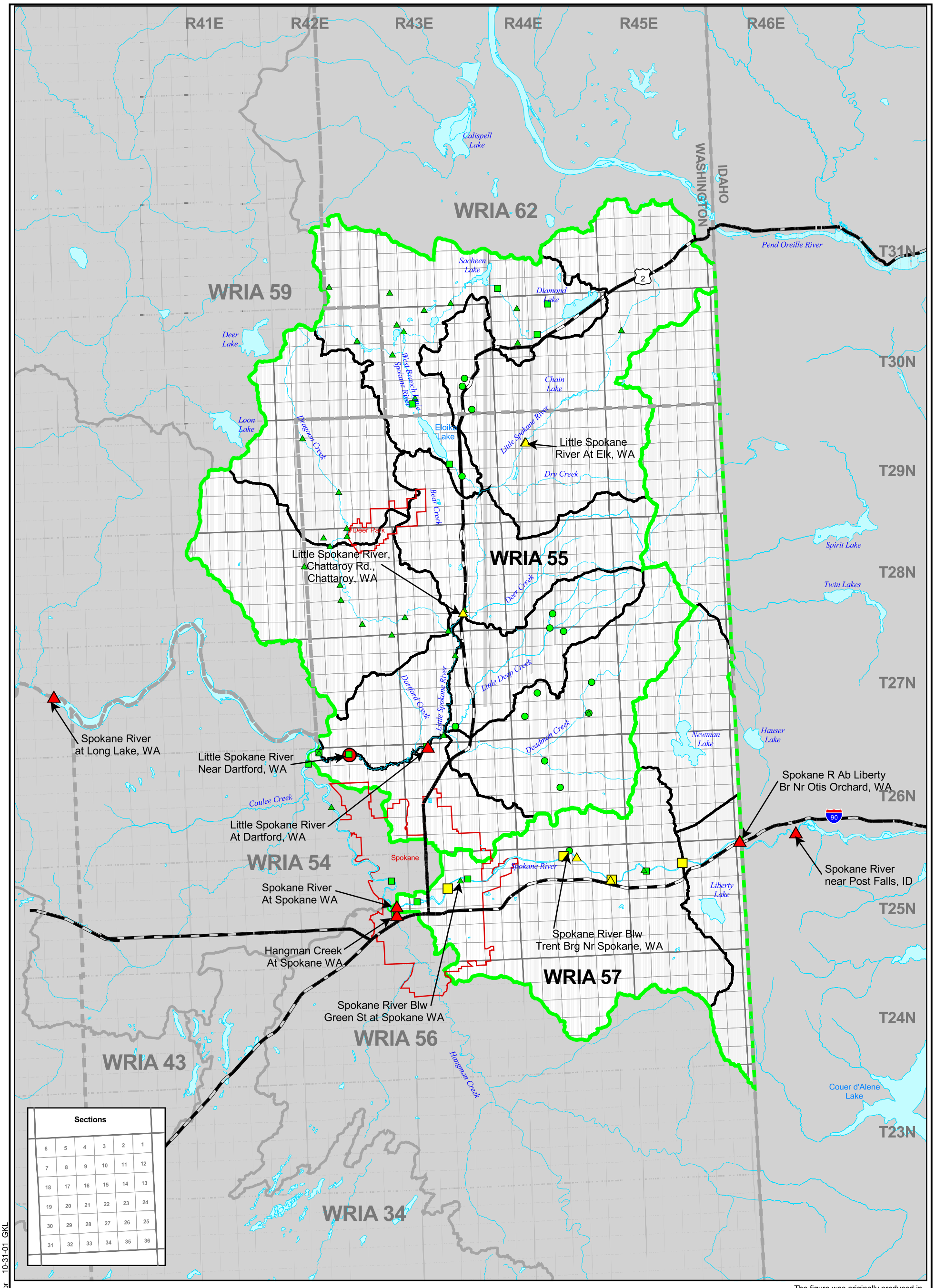
This figure was originally produced in color. Reproduction in black and white may result in loss of information.

Golder Associates

WRIA 57
Contributing Drainage

Drawn: GKL	App'd:	Date: Oct. 31, 2001	Figure: 5.1

L:\projects\2001\013372\gis\aprs\overview.apr 10-31-01 GKL



Legend

- WRIA Boundaries
- WAU Boundaries
- Townships
- Sections
- City Limits
- County Boundaries
- Roads
- Rivers and Streams

Years in Record

Gage Measures	< 20	20 - 50	> 50
Flow and Water Quality	▲	△	▲
Flow	●	○	●
Water Quality	■	□	■

Note: Called out gages have a significant daily flow record. Period of Record may not be continuous

N

0 5

Scale 1" = 5 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

The figure was originally produced in color. Reproduction in black and white may result in loss of information

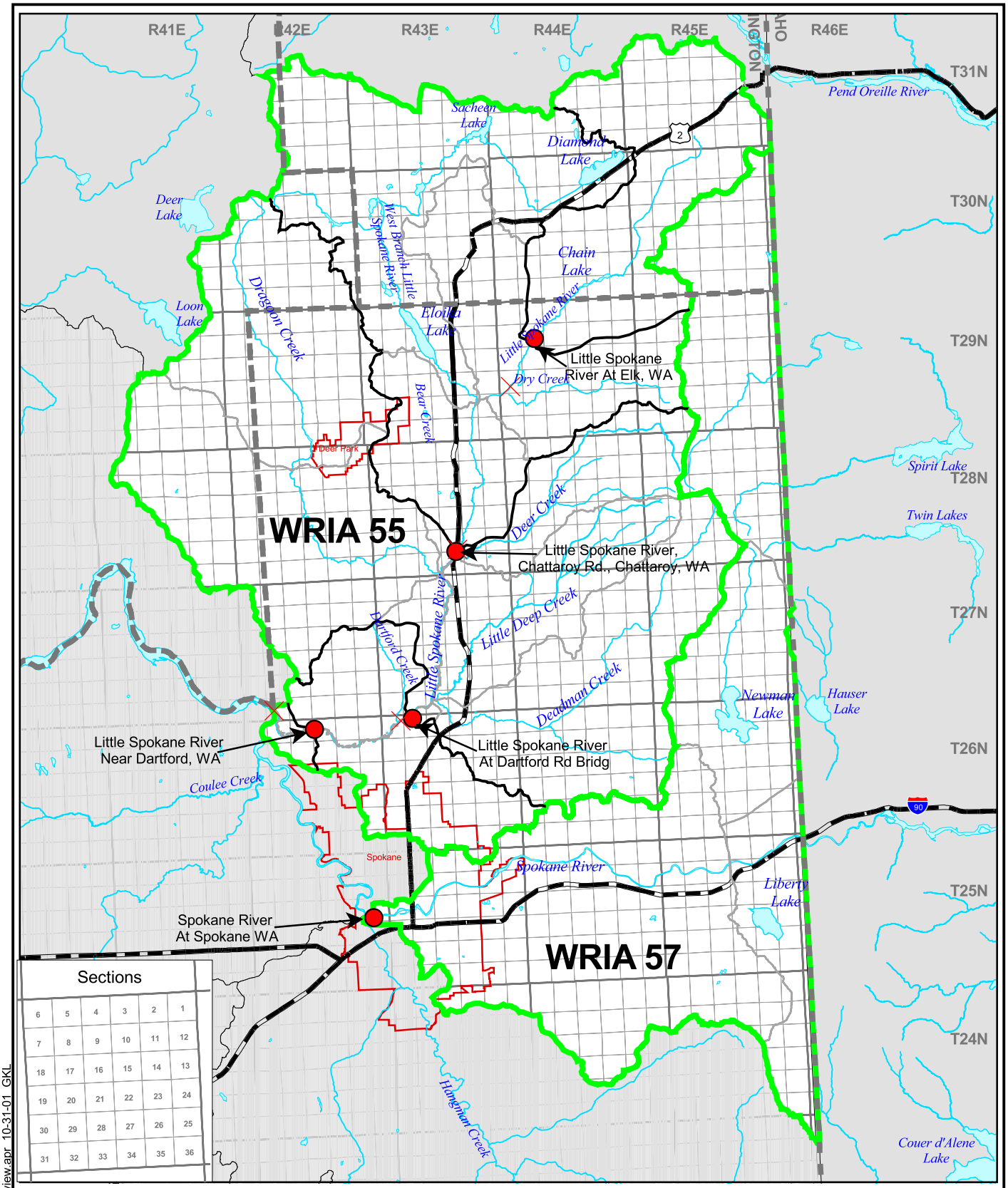
Original Data Source: Washington Department of Ecology, Spokane County

Golder Associates

Surface Water Monitoring Sites

Drawn: GKL	App'd:	Date: Oct. 31, 2001	Figure: 5.2a

L:\projects\2001\0131372\gis\Aprs\overview.apr 10-31-01 GKL



LEGEND

- WRIA Boundaries
- WAU Boundaries
- Townships
- Sections
- City Limits
- County Boundaries
- Roads
- Rivers and Streams
- Surface Water Monitoring Stations
- Point Catchment Areas
- Monitoring Point Control

N

0 6

Scale 1" = 6 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

Original Data Source: Washington Department of Ecology

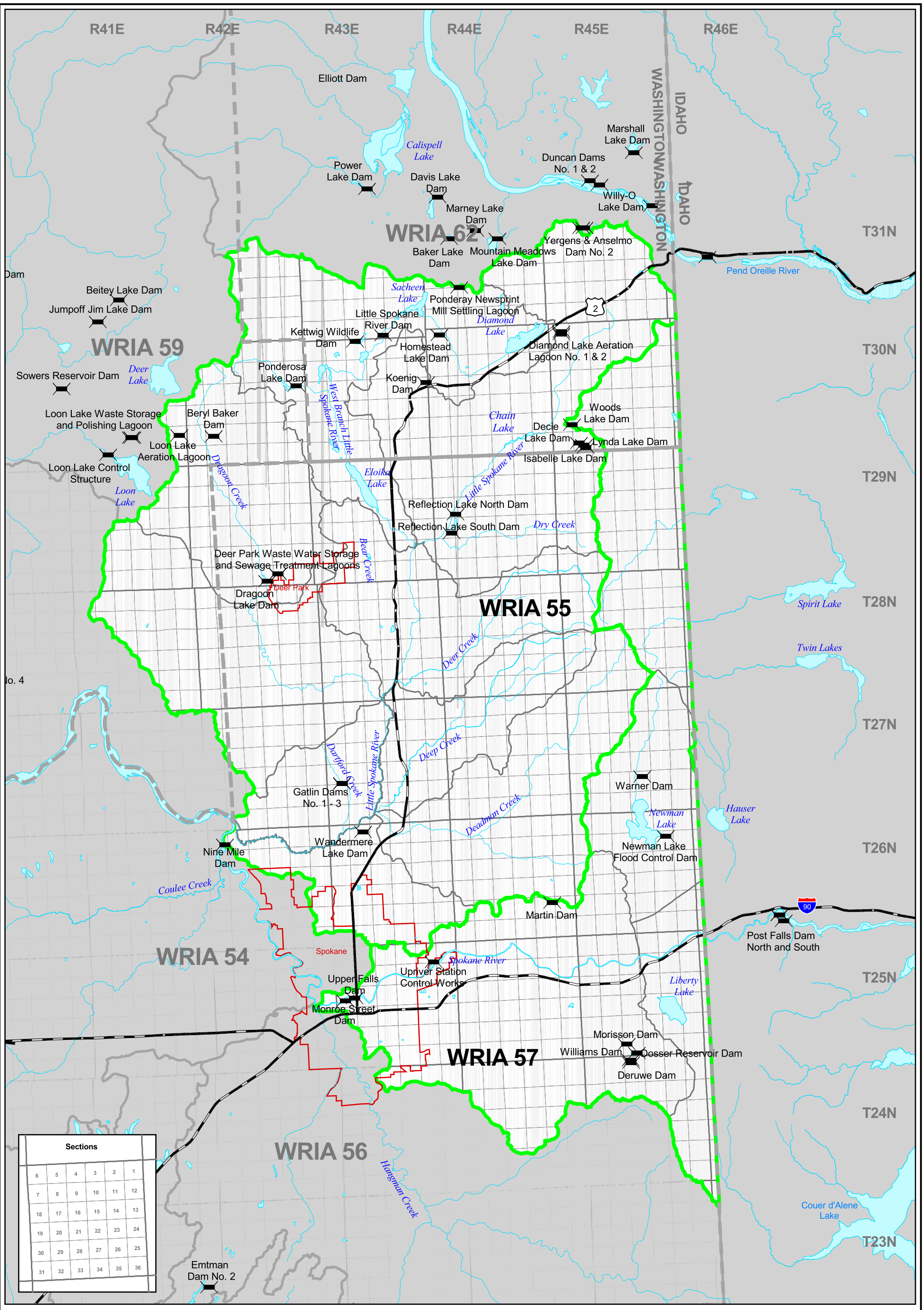
This figure was originally produced in color. Reproduction in black and white may result in loss of information.

Golder Associates

MSF Control Points

Drawn: GKL	App'd:	Date: Oct. 31, 2001	Figure: 5.2b

L:\projects\2001\0131372\gis\aprs\overview.apr 10-31-01 GKL



Legend

- WRIA Boundaries
- WAU Boundaries
- Townships
- Sections
- City Limits
- County Boundaries
- Roads
- Rivers and Streams
- Dam Locations

N

0 4

Scale 1" = 4 Miles

Map Projection: Washinton State Plane North Zone, NAD83, Feet

The figure was originally produced in color. Reproduction in black and white may result in loss of information

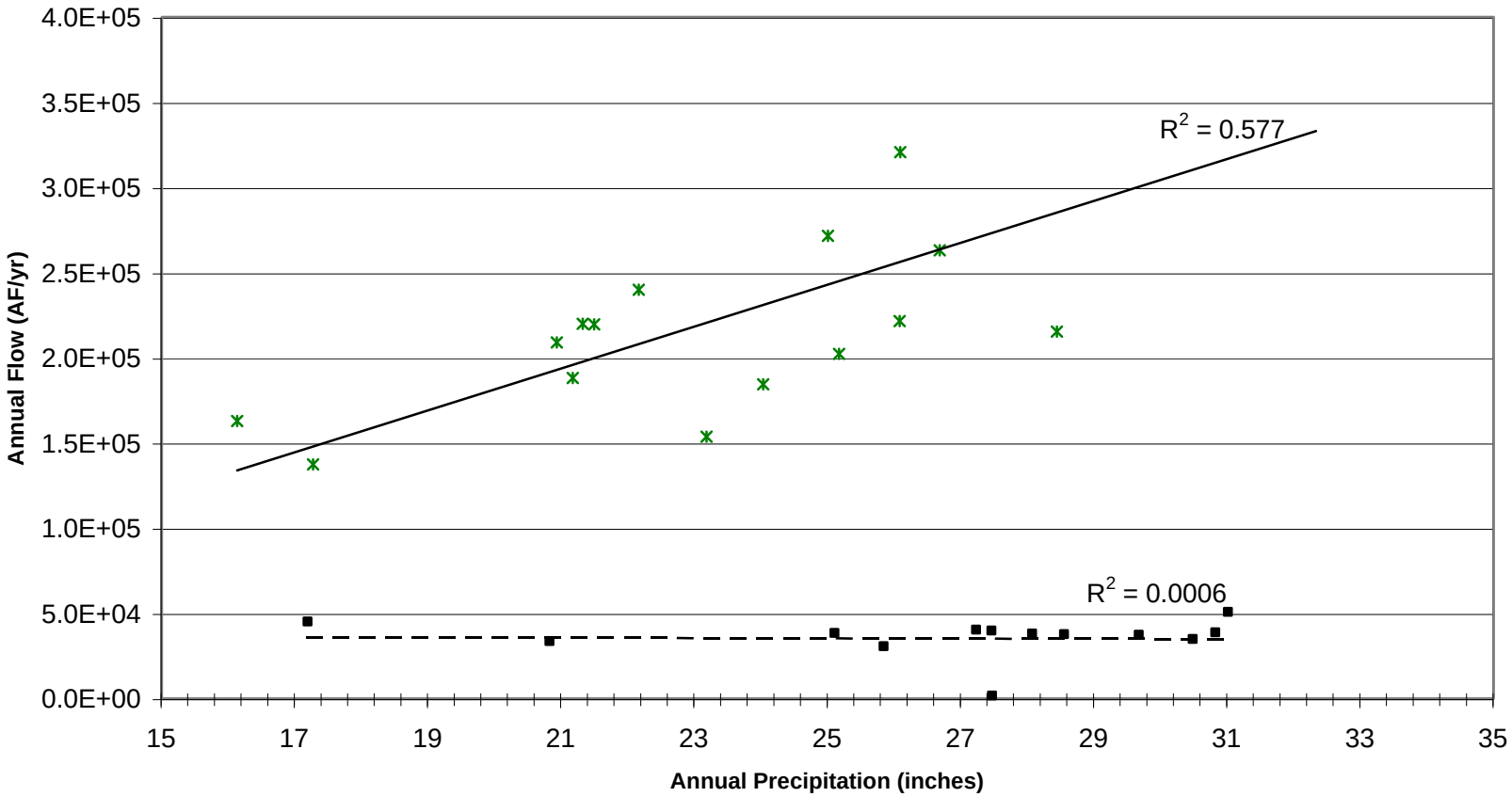
Original Data Source: Washington Department of Ecology, USGS, U.S. Army Corps of Engineers

Golder Associates

Dam Locations

Drawn: GKL	App'd:	Date: June 16, 2003	Figure: 5.3

L:\projects\2001\0131372\gis\Aprs\overview.apr 10-31-01 GKL



Legend

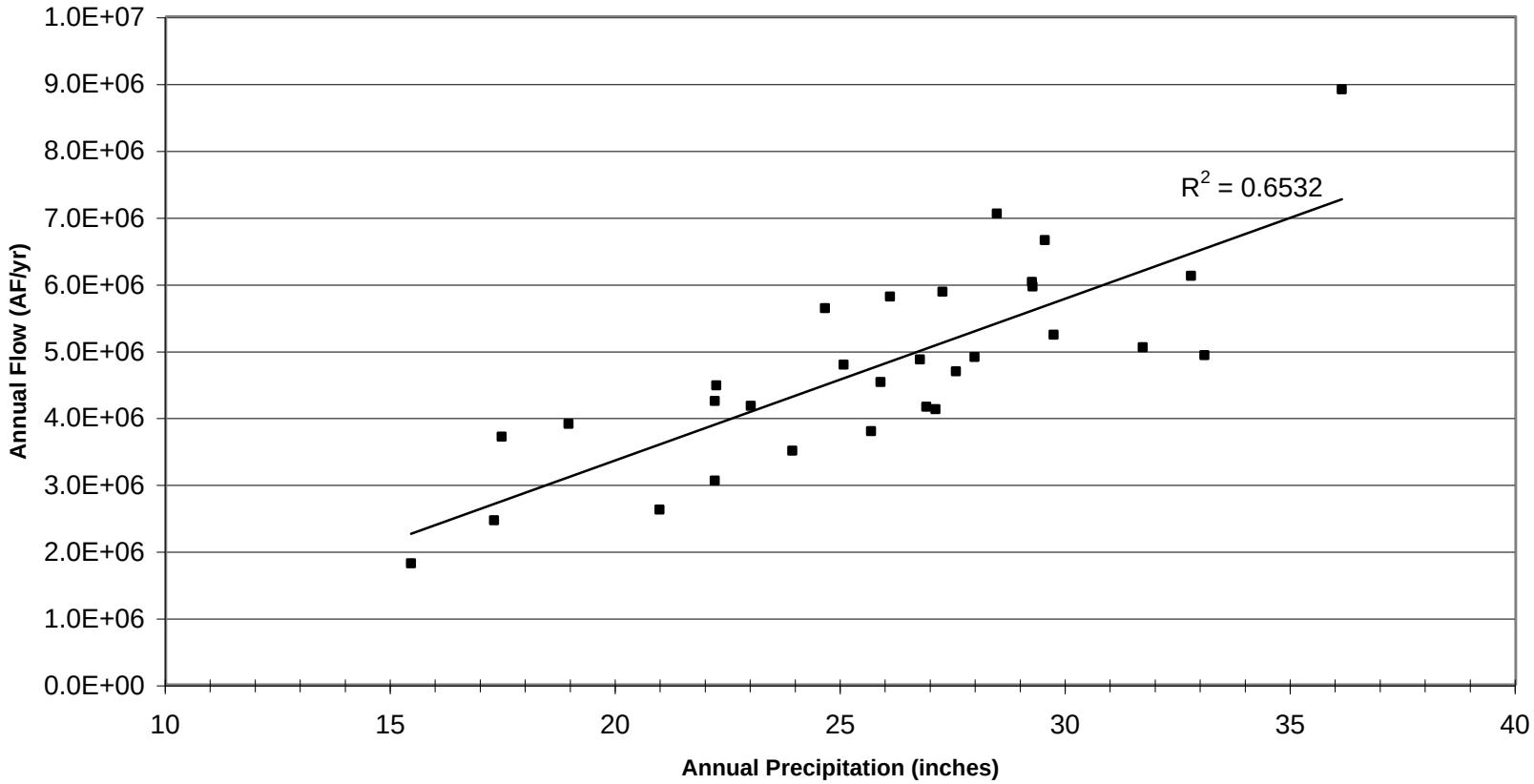
- ■ LSR @ Elk (stn 12427000) vs Newport (stn 455844), WY 1960 - 1971
- ✱ LSR @ Dartford (stn 12431000 vs Deer Park 2 E (stn 452066) WY 1961-1976

FIGURE 5.4a: Total Annual Flow Volume vs Total Annual Precipitation - WRIA 55

Spokane County
Watershed Inventory Assesment

013-1372, 06/19/01, id169.xls

Golder Associates



Legend

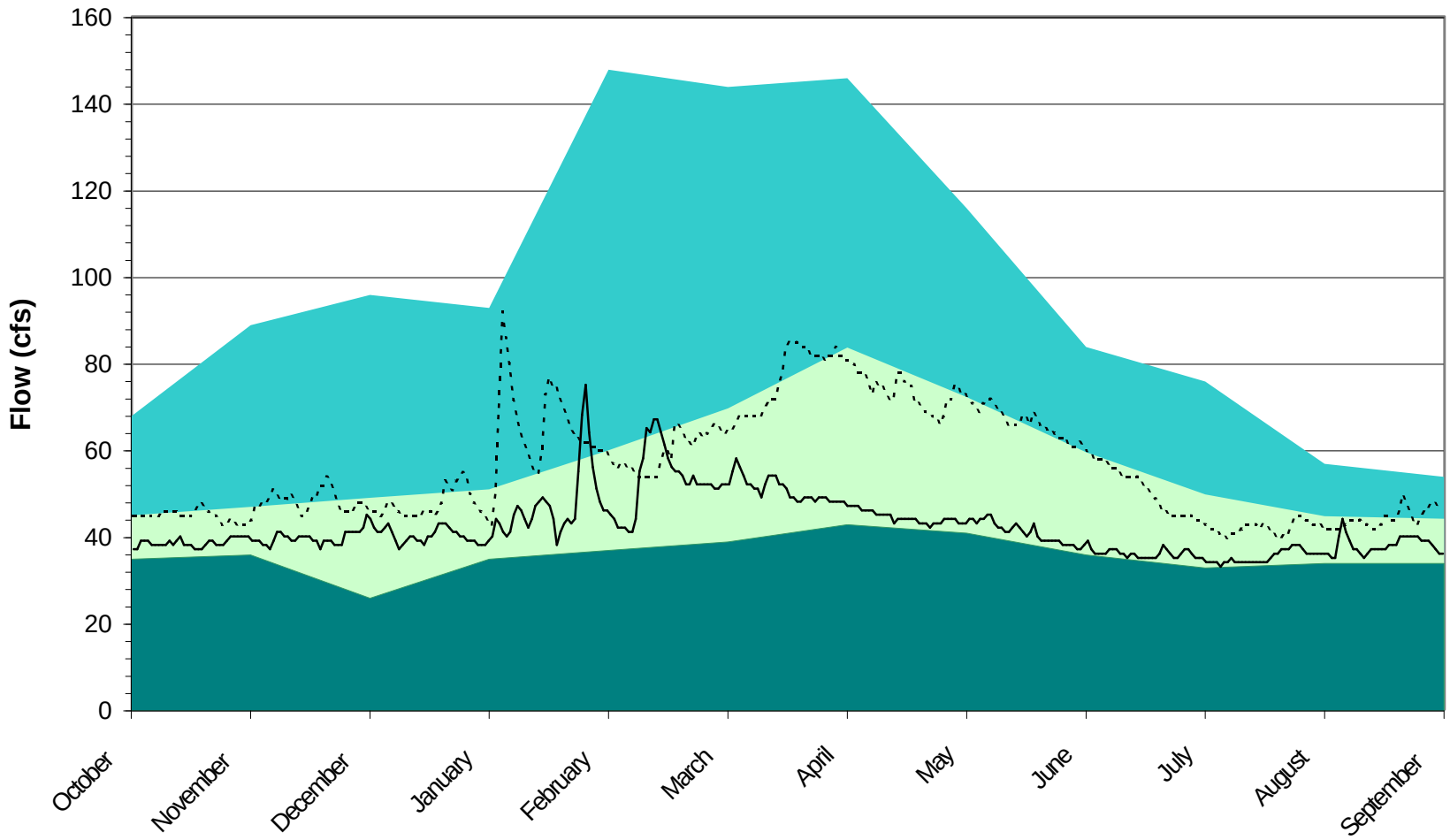
- Spokane River At Spokane Wa (stn 12422500) vs. Coeur D'Alene 1E (stn 101956), WY 1960-1990

FIGURE 5.4b: Total Annual Flow Volume vs Total Annual Precipitation - WRIA 57

Spokane County
Watershed Inventory Assesment

013-1372, 06/19/01, id169.xls

Golder Associates



Legend

- Max Recorded Daily Flow
- Average Daily Flow
- Min Recorded Daily Flow
- 1968 - Dry Year
- 1959 - Average Year

POR 1949-1971. Surrogate year used for Average and Dry year data

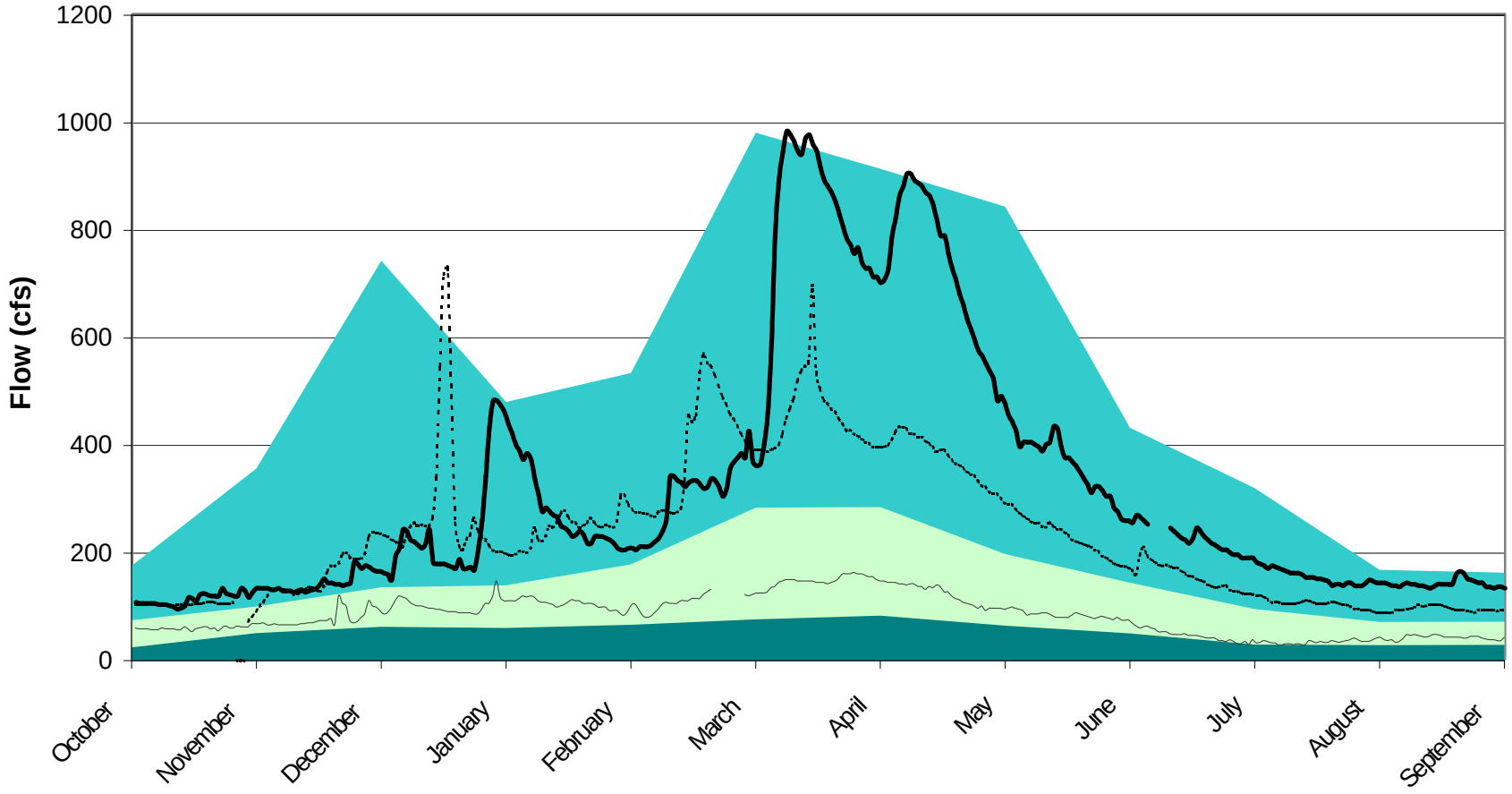
FIGURE 5.5a:

Little Spokane River At Elk, WA (USGS stn. 12427000)

Spokane County
Watershed

013-1392, id143graphs.xls, 10/07/2001

Golder Associates



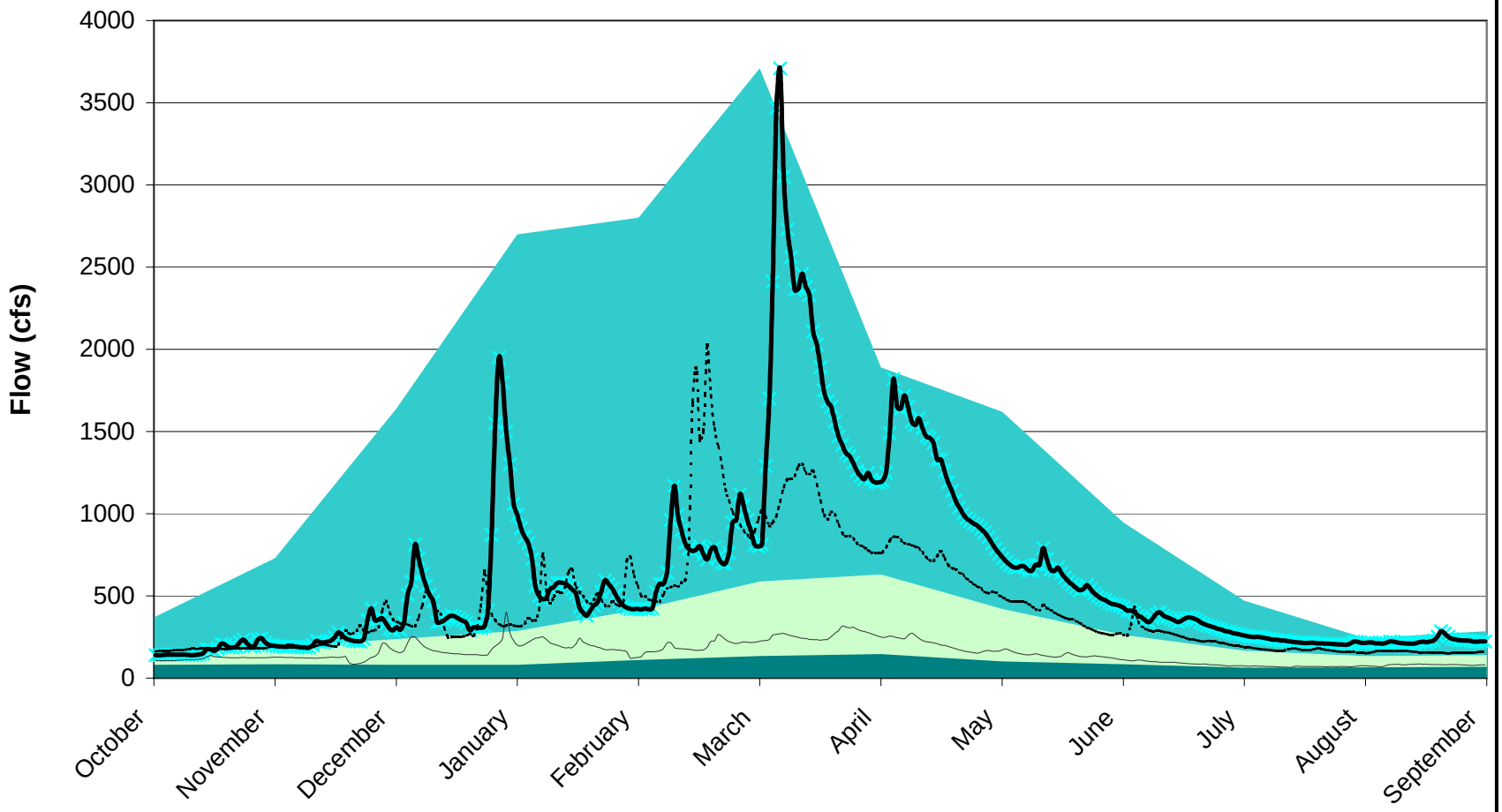
Legend

- Max Recorded Daily Flow
- Average Daily Flow
- Min Recorded Daily Flow
- 1994 - Dry Year
- 1999 - Average Year
- 1997- Wet Year

POR 1976 - present

FIGURE 5.5b:
Little Spokane River, Chattaroy Rd., Chattaroy, WA (SCC 8327Q)
Spokane County
Watershed Assessment
013-1392, id147 graphs.xls, 08/09/2001

Golder Associates



Legend

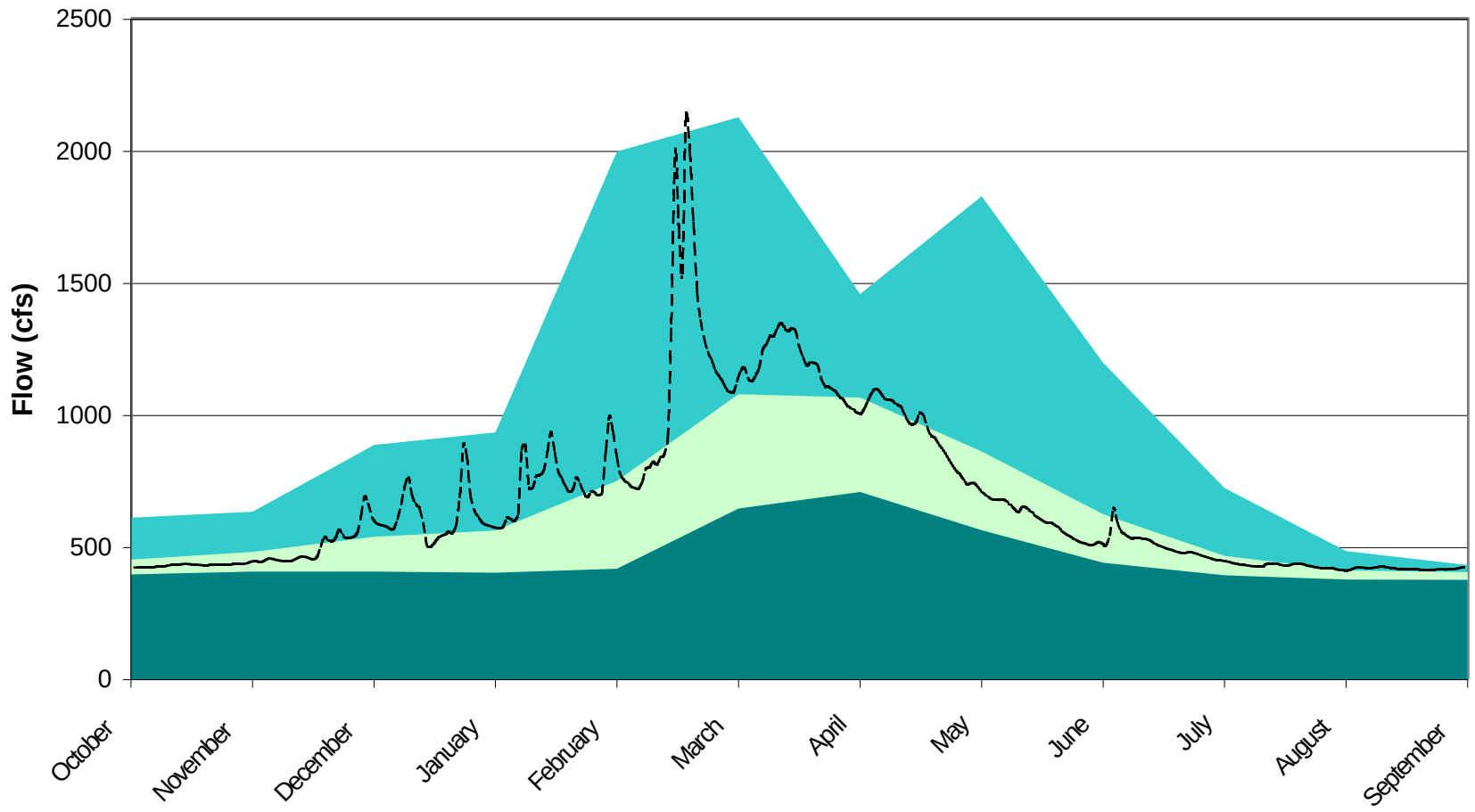
- Max Recorded Daily Flow
- Average Daily Flow
- Min Recorded Daily Flow
- 1997 - Wet Year
- 1999 - Average Year
- 1994 - Dry Year

POR 1930 - 1932, 1948 - 1999

FIGURE 5.5c:
Little Spokane River at Dartford, WA (USGS gage 12431000)
Spokane County
Watershed Assessment

013-1392, id142 graphs.xls, 07/23/2001

Golder Associates



Legend

- Max Recorded Daily Flow
- Average Daily Flow
- Min Recorded Daily Flow
- 1999 - Average Year

POR: 1949-1951, 1998-1999

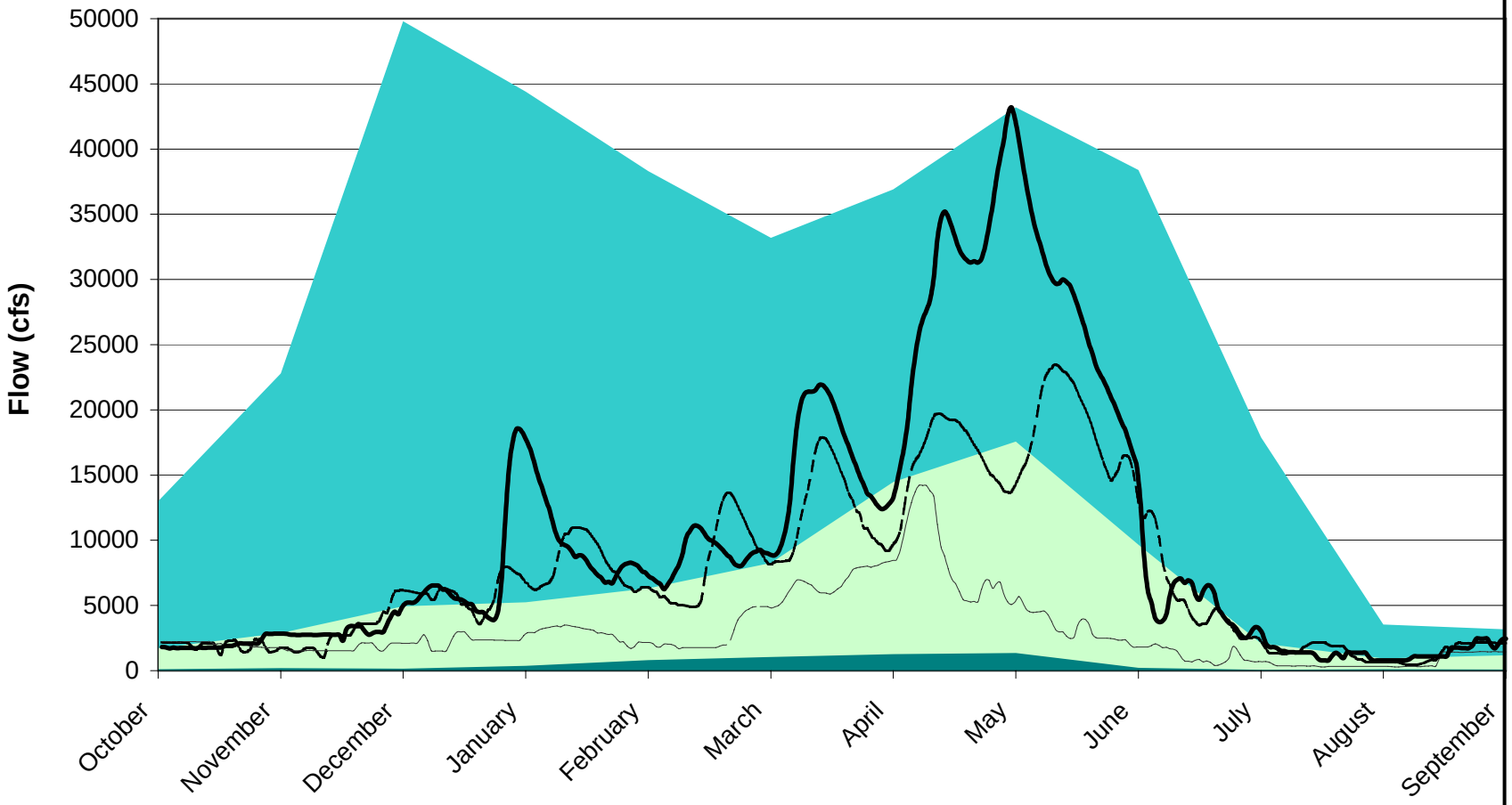
FIGURE 5.5d:

Little Spokane River Near Dartford, Wash. (USGS gage 12431500)

Spokane County
Watershed Assessment

013-1392, id146 graphs.xls, 07/23/2001

Golder Associates



Legend

- Max Daily Recorded Flows
- Average Daily Flow
- Min Daily Recorded Flow
- 1999 - Average Year
- 1994 - Dry Year
- 1997 - Wet Year

POR 1976 - present

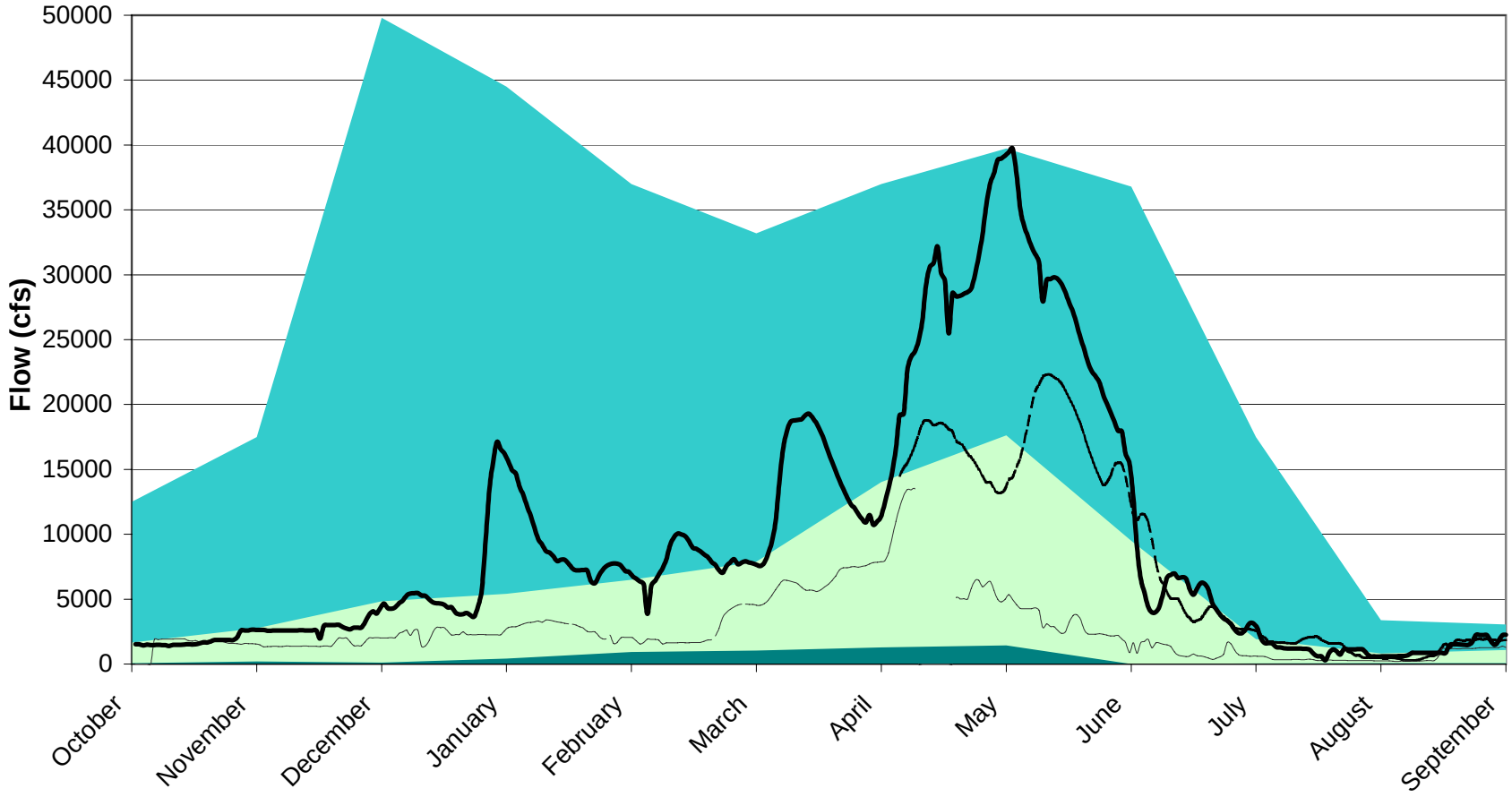
FIGURE 5.5e:

Spokane River near Post Falls, ID (USGS gage 12419000)

Spokane County
Watershed Assessment

013-1392, id172 graphs.xls, 10/15/2001

Golder Associates



Legend

- Max Recorded Daily Flow
- Average Daily Flow
- Min Recorded Daily Flow
- 1999 - Average Year
- 1994 - Dry Year
- 1997 - Wet Year

POR 1930 - 1983, 1994-1999. 93-98 collected by SCC

FIGURE 5.5f:

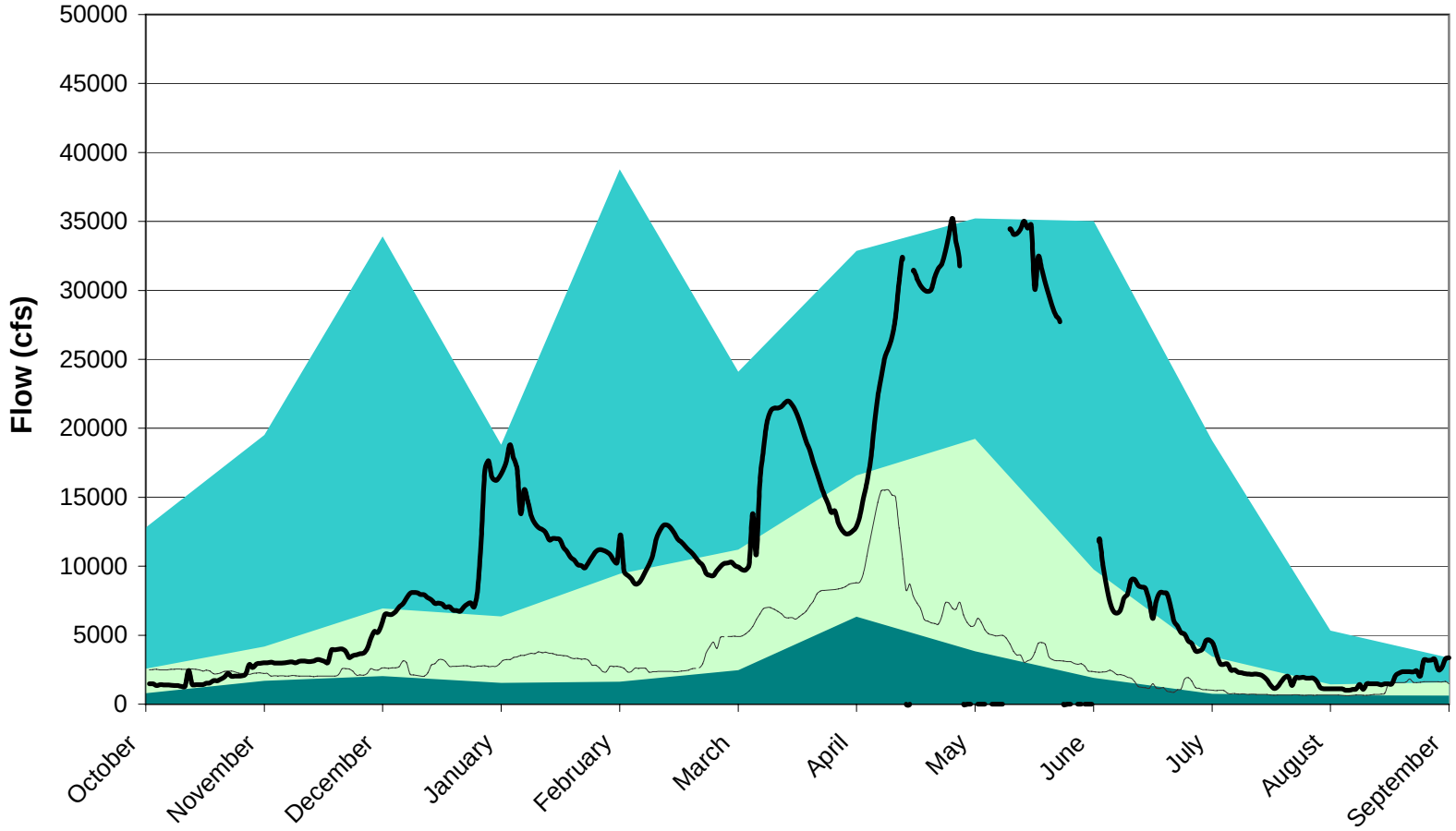
Spokane River abv Liberty Bridge nr Otis Orchard, Wash stn. 12419500

Spokane County

Watershed Assessment

013-1392, id164graphs.xls, 07/24/2001

Golder Associates



Legend

- Max Daily Recorded Flow
- Average Daily Flow
- Min Daily Recorded Flow
- 1994 - Dry Year
- 1997 - Wet Year

POR 1949-1952, 1993- 1998. Note 1993 - 1998 collected by SCC

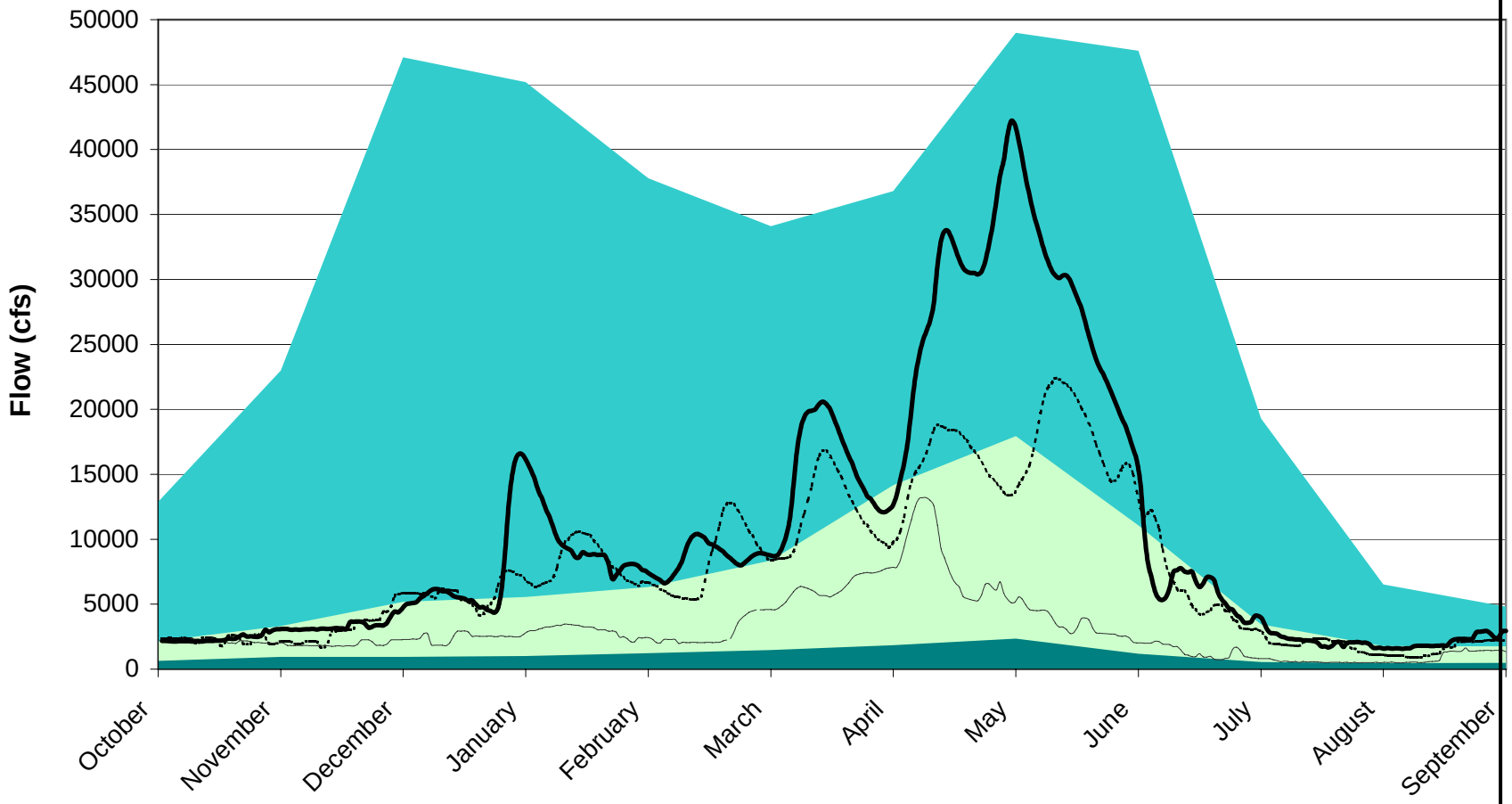
FIGURE 5.5g:

Spokane River Blw Greene St at Spokane, WA (USGS gage 12422000)

Spokane County
Watershed Assessment

013-1392, id170 graphs.xls, 07/24/2001

Golder Associates



Legend

- Max Recorded Daily Flow
- Average Daily Flow
- Min Recorded Daily Flow
- 1999 - Average Year
- 1994 - Dry Year
- 1997 - Wet Year

POR 1892-1999

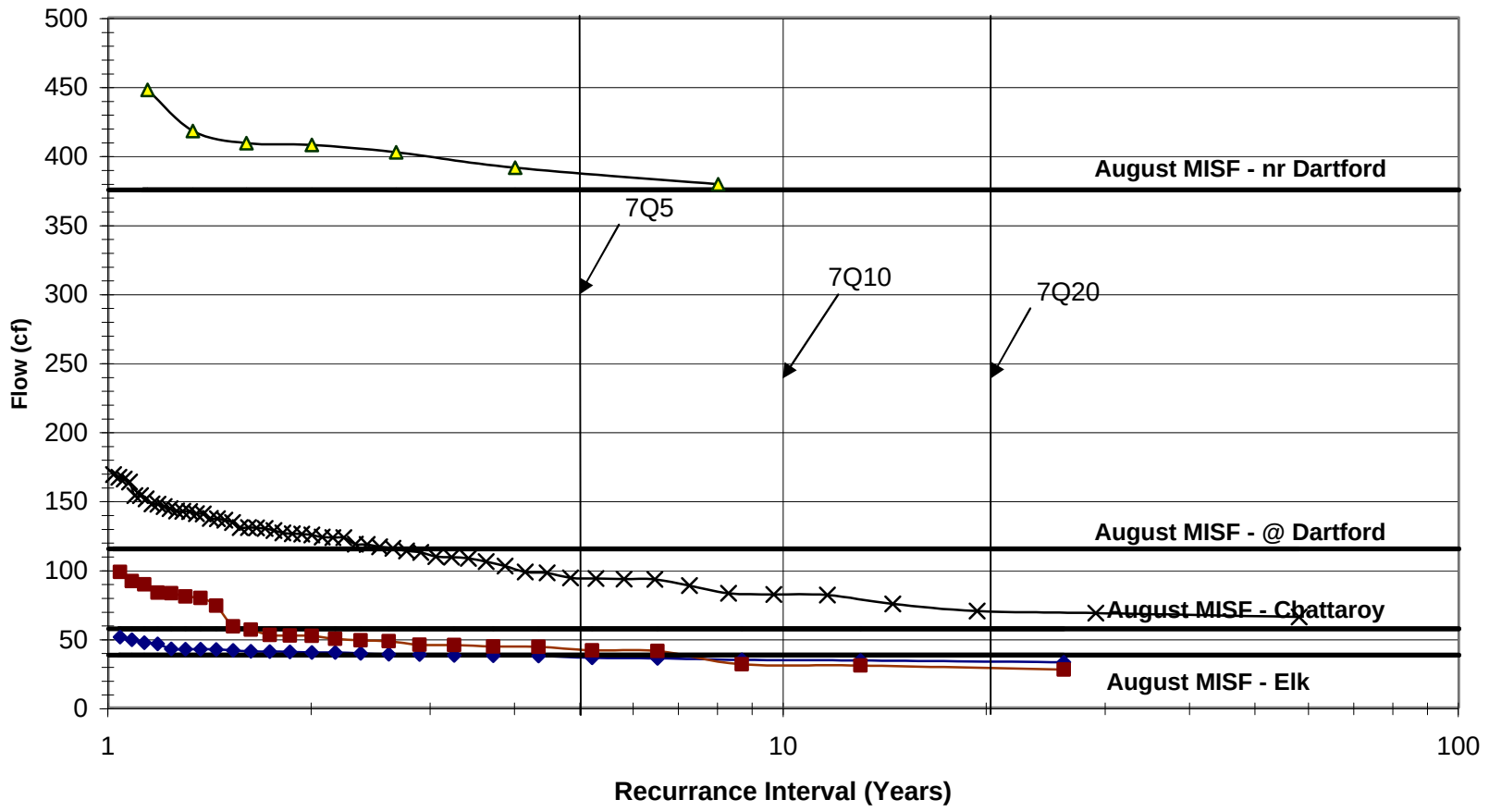
FIGURE 5.5h:

Spokane River At Spokane, WA (USGS gage 12422500)

Spokane County
Watershed Assessment

013-1392, id169 graphs.xls, 07/24/2001

Golder Associates



Legend

- Little Spokane River @ Elk (stn 12427000)
- Little Spokane River, Chattaroy Rd. (stn 001)
- Little Spokanr River @ Dartford (stn 12431000)
- Little Spokane River nr Dartford (stn 12431500)

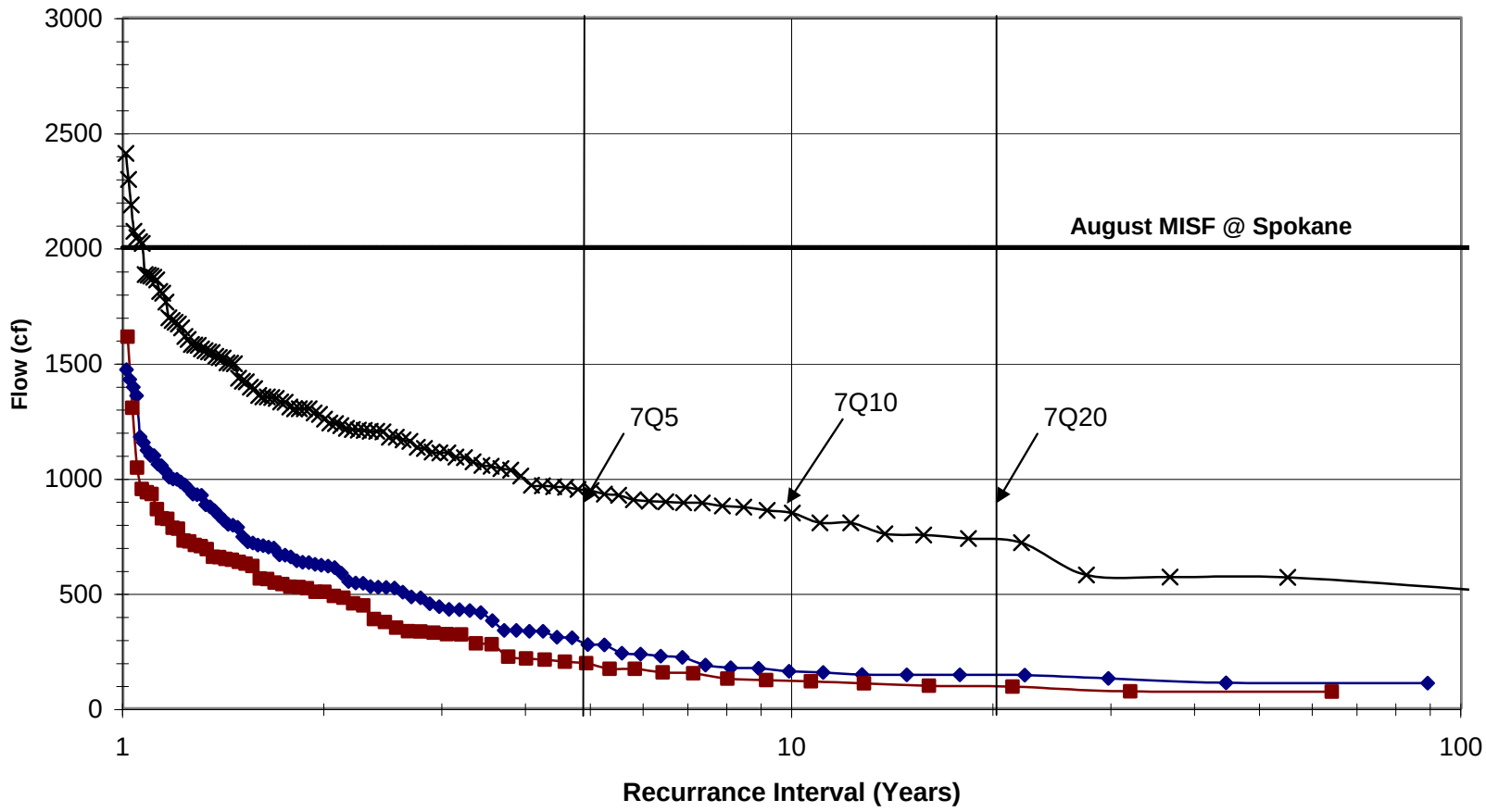
August MISF - Minimum Instream Flows for August, Ch 173-5555 WAC

FIGURE 5.6a:
Recurrance Interval of 7-Day Average Minimum Flows in WRIA 55

Spokane County
Watershed Inventory Assesment

013-1372, 07/24/01, 7 day low flow.xls

Golder Associates



Legend

- Spokane River nr Post Falls, ID (stn 12419000)
- Spokane River Abv Liberty Bridge (stn 12419500)
- Spokane River at Spokane (stn 12422500)

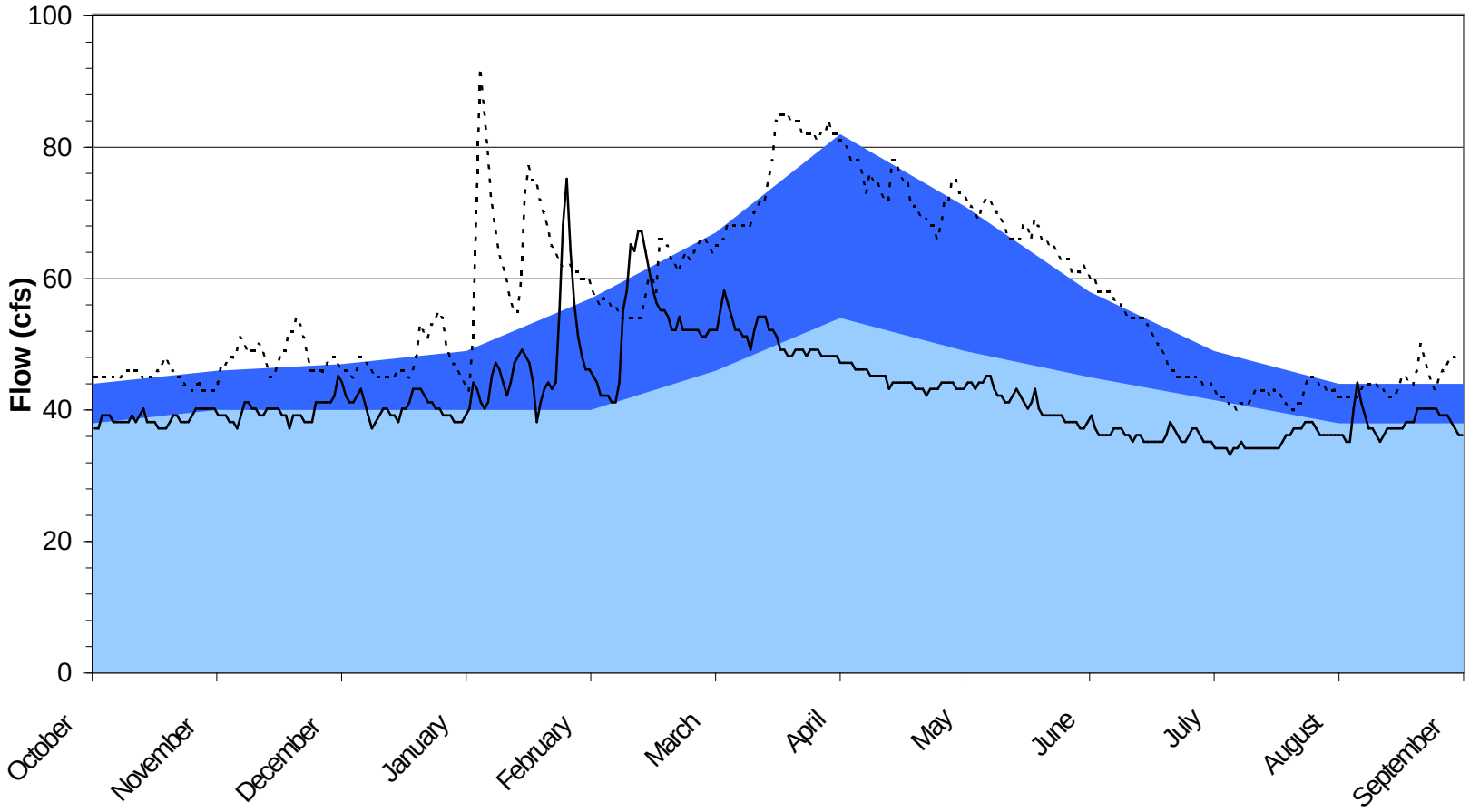
August MISF - Minimum Instream Flows for August, 1999 Ltr WDFW

FIGURE 5.6b:
Recurrance Interval of 7-Day Average Minimum Flows in WRIA 57

Spokane County
Watershed Inventory Assesment

013-1372, 07/25/01, 7 day low flow.xls

Golder Associates



Legend

- Average Baseflow
- Instream Flow Requirements
- 1959 - Average Year
- 1968 - Dry Year

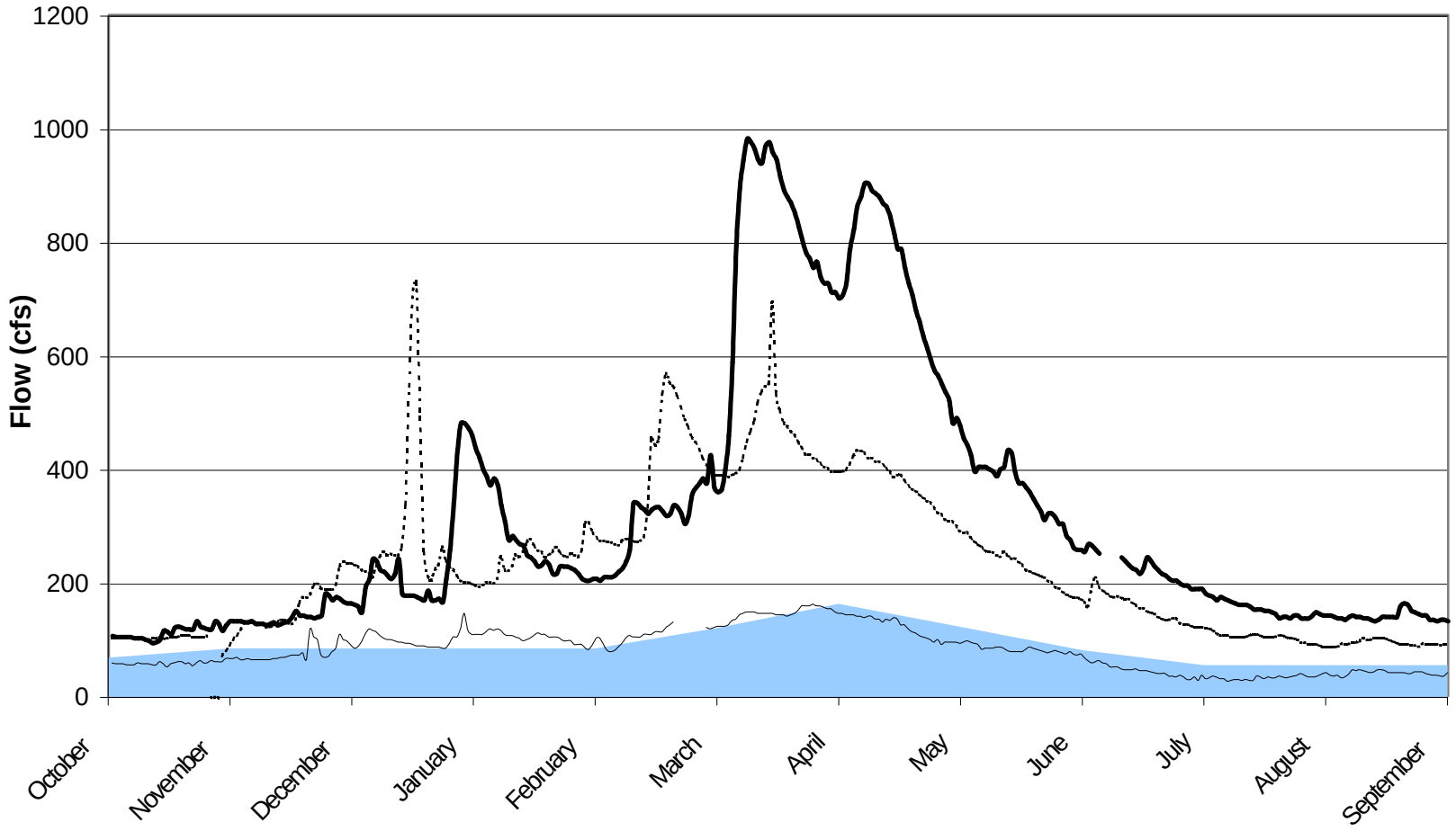
POR 1949-1971, Surrogate data used for Average and Dry Year
Note:Baseflow not computed during spring thaw (March through June)

FIGURE 5.7a:
Little Spokane River At Elk, WA (USGS stn. 12427000)

Spokane County
Watershed Assessment

013-1392, id143graphs.xls, 10/07/2001

Golder Associates



Legend

- Instream Flow Requirements
- 1994 - Dry Year
- 1999 - Average Year
- 1997 - Wet Year

POR 1976 - present

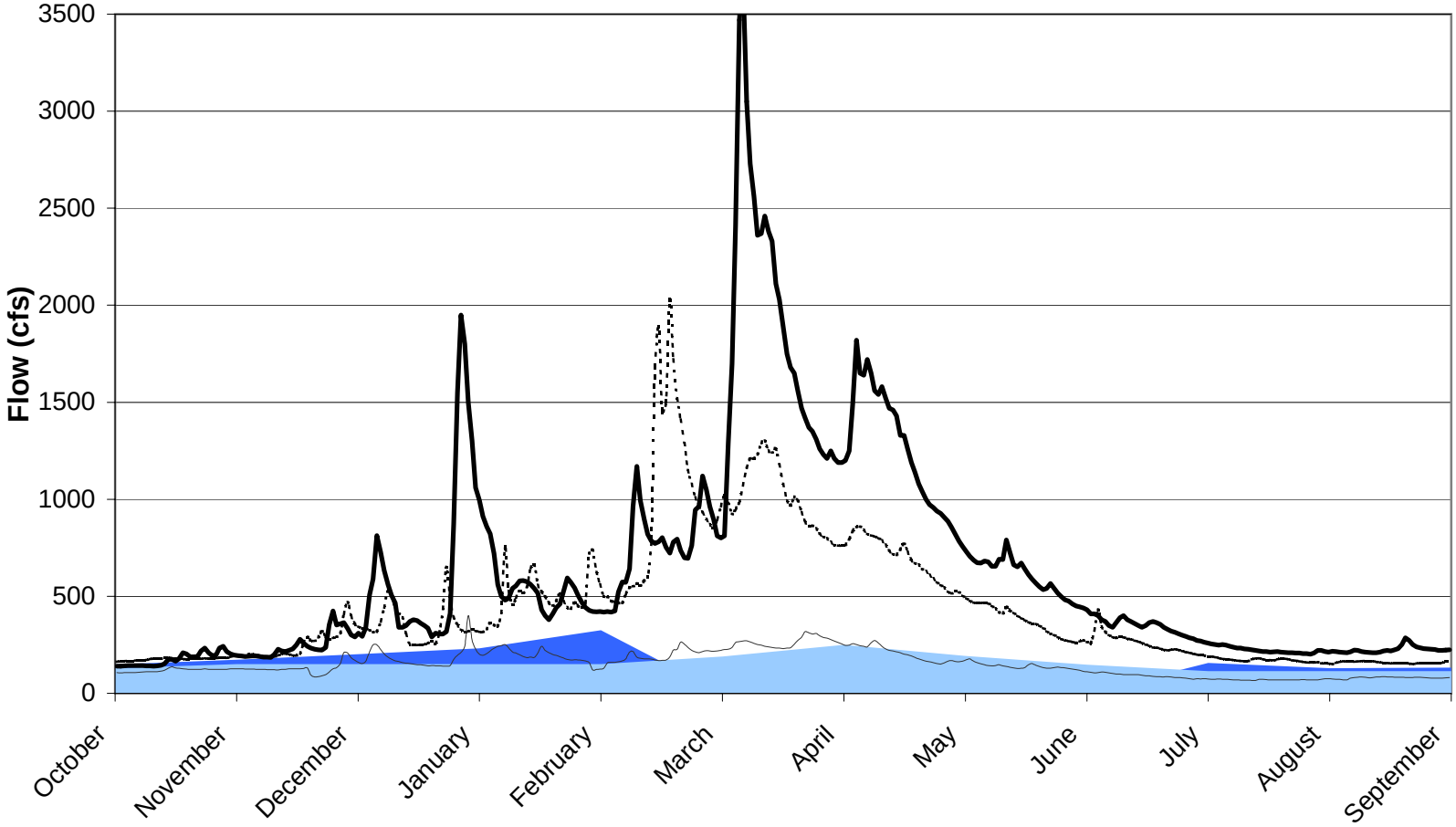
Note: Baseflow estimates not available for this gage

FIGURE 5.7b:
Little Spokane River, Chattaroy Rd., Chattaroy, WA (SCC 001)

Spokane County
Watershed Assessment

013-1392, id147 graphs.xls, 07/23/2001

Golder Associates



Legend

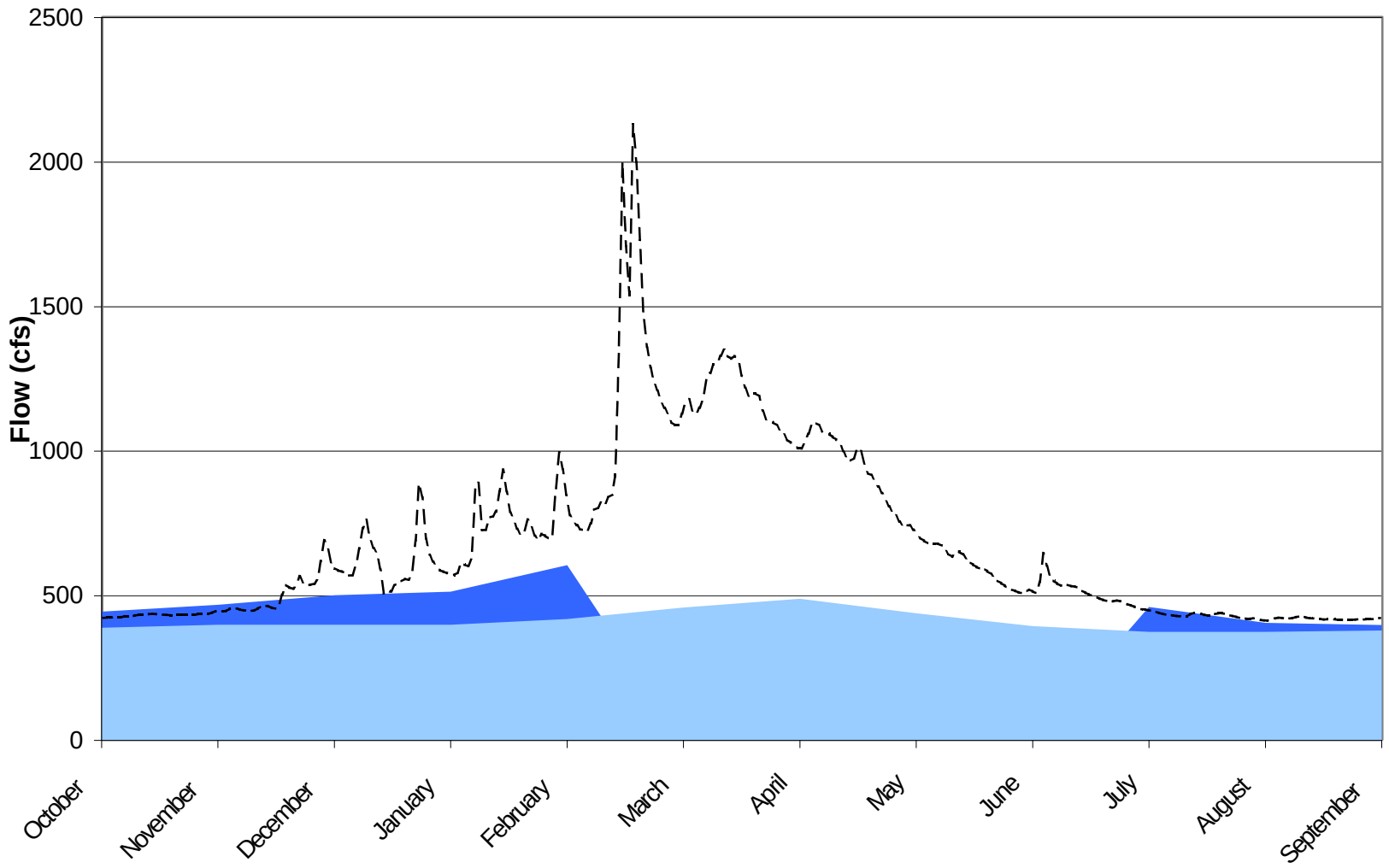
- Average Baseflow
- Instream Flow Requirements
- 1997 - Wet Year
- 1999 - Average Year
- 1994 - Dry Year

POR 1930 - 1932, 1948 - 1999.
Note: Baseflow not computed during spring thaw (March through June)

FIGURE 5.7c:
Little Spokane River at Dartford, WA (USGS gage 12431000)
Spokane County
Watershed Assessment

013-1392, id142 graphs.xls, 07/23/2001

Golder Associates



Legend

Average Baseflow

Instream Flow Requirements

1999 - Average Year

POR: 1949-1951, 1998-1999

Note: Baseflow not computed during spring thaw (March through June).
Instream Flows are for Confluence Control Point downstream of this gage.

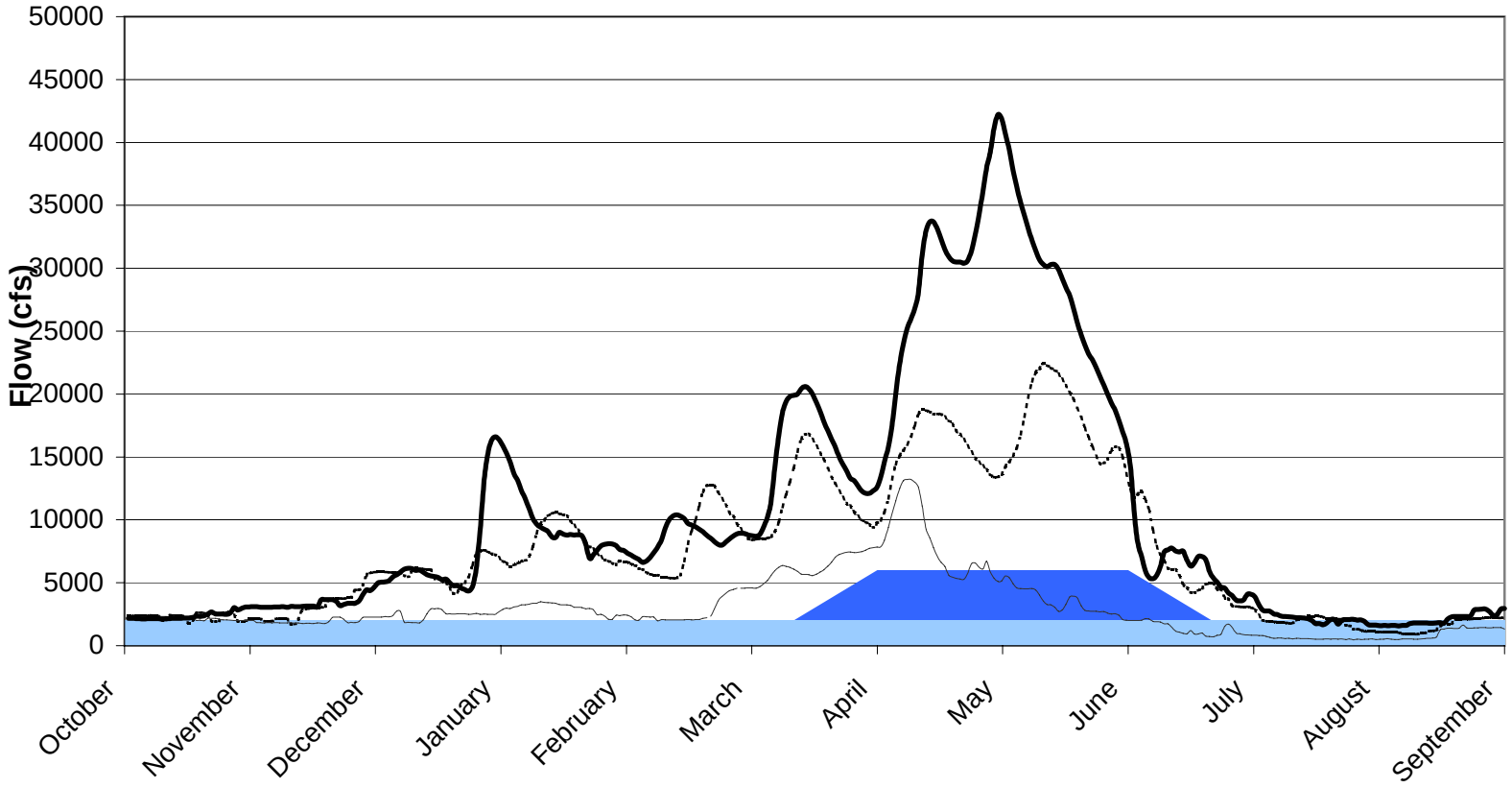
FIGURE 5.7d:

Little Spokane River Near Dartford, WA (USGS gage 12431500)

Spokane County
Watershed Assessment

013-1392, id146 graphs.xls, 07/23/2001

Golder Associates



Legend

- Suggested Instream Flows (1988 Report, WDFW)
- Suggested Instream Flow (1999 Ltr, WDFW)
- 1999 - Average Year
- 1994 - Dry Year
- 1997 - Wet Year

POR 1892-1999

Note: Estimated baseflow data not available for this gage

FIGURE 5.7e:

Spokane River At Spokane WA (USGS gage 12422500)

Spokane County
Watershed Assessment

013-1392, id169 graphs.xls, 07/24/2001

Golder Associates