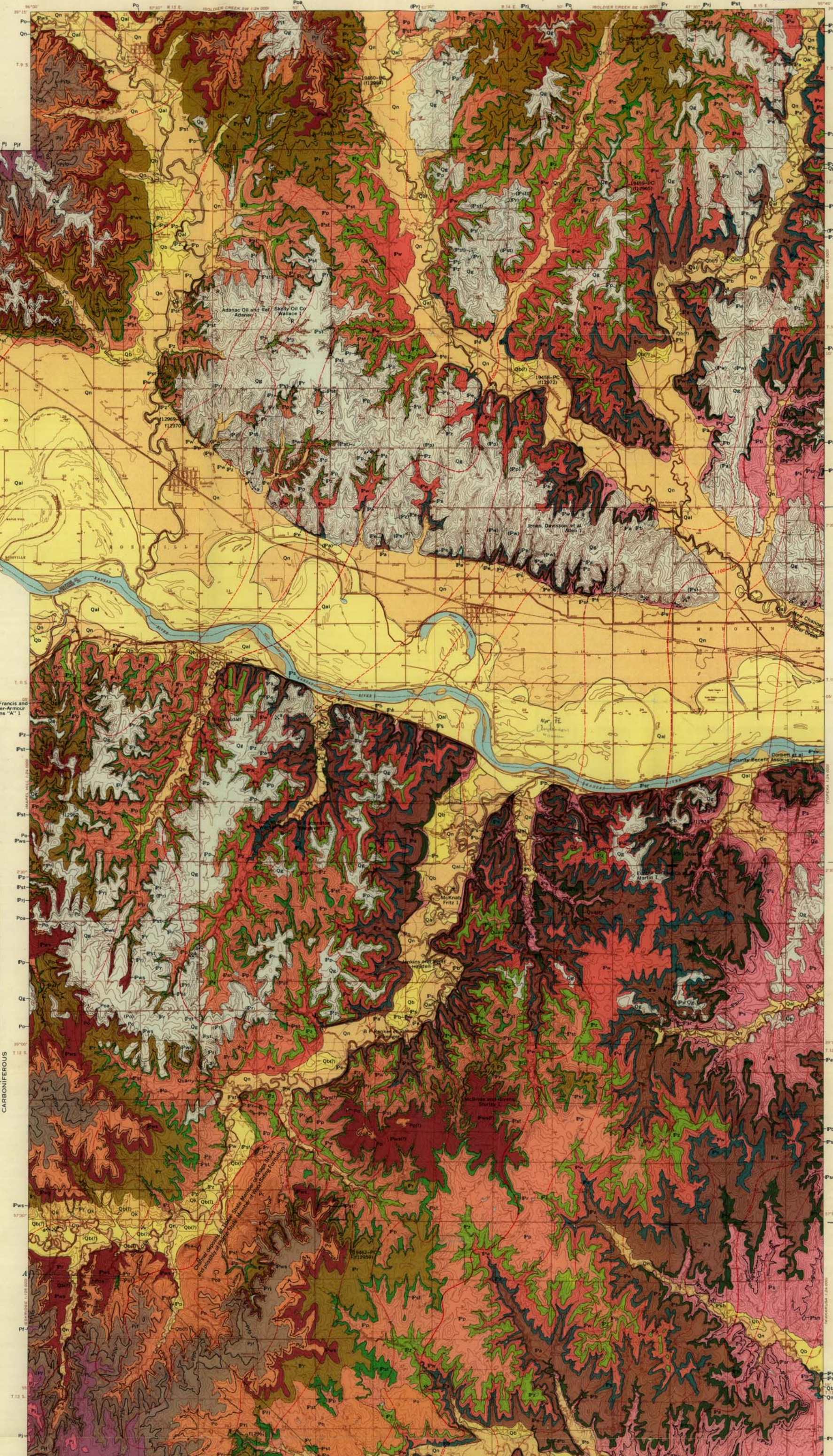
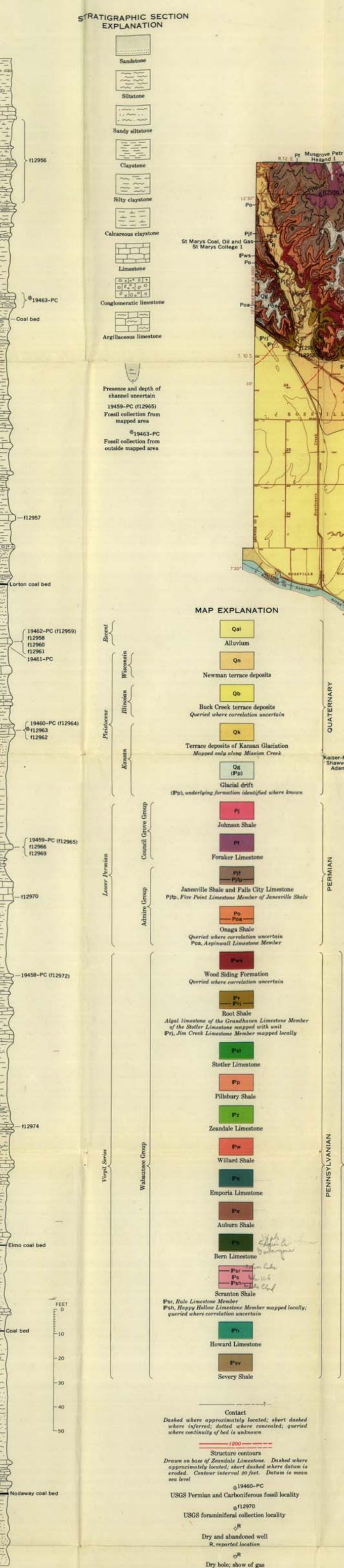


SYSTEM	SERIES	GROUP	FORMATION	MEMBER	THICKNESS IN FEET	
PERMIAN	Lower Permian	Council Grove	Council Grove Limestone	Johnson Shale	20	
				Long Creek Limestone	5	
				Hughes Creek Shale	25-40	
		Admire	Admire Limestone	Americus Limestone	2.5-5.7	
				Hamlin Shale	30-40	
				Five Point Limestone	4-8	
		Upper Permian	Falls City	Falls City Limestone	Coal bed	
					Hawkeye Shale	12-26
			Orange	Orange Shale	Aspinwall Limestone	1.5-11.5
					Towle Shale	6.5-140
	Wood Siding		Wood Siding Formation	Brownville Limestone	1-2.9	
				Pony Creek Shale	5-11	
				Grayhorse Limestone	0.5-4	
	Carboniferous	Wabauunsee	Wabauunsee Group	Plumb Shale	7-105	
				Nebraska City Limestone	0.3-2.5	
				French Creek Shale	19-29	
				Jim Creek Limestone	0.4-2.4	
				Friedrich Shale	12-30	
		Virgil	Virgil Group	Virgil Series	Grandhaven Limestone	1.2-6
					Dry Shale	0.1-1.6
Dover Limestone					1-4.8	
Maple Hill Limestone					1.2-2	
Wamego Shale					9-35	
Carboniferous	Zandale	Zandale Group	Tarkio Limestone	2-13		
			Elmont Limestone	2.5-5.2		
			Harveyville Shale	4.3-15		
			Reading Limestone	1.3-4.6		
			Wakarusa Limestone	1.7-4		
	Ashburn	Ashburn Group	Ashburn Series	Soldier Creek Shale	6.6-15	
				Burlingame Limestone	1-7	
				Silver Lake Shale	20-36	
				Rulo Limestone	0.6-3.6	
				Cedar Vale Shale	25-29+	
Scranton	Scranton Group	Scranton Series	Happy Hollow Limestone	0.4-3.4		
			White Cloud Shale	50-60+		
			Utopia Limestone	2-12		
			Winzler Shale	0.6-6.2		
			Church Limestone	0.3-2.2		
Lower Carboniferous	Lower Carboniferous Group	Lower Carboniferous Series	Aarde Shale	0.7-5.5		
			Severy Shale	30		
			Howard Limestone			
			Severy Shale			
			Severy Shale			



GEOLOGIC MAP OF WESTERN SHAWNEE COUNTY AND PARTS OF ADJACENT COUNTIES, KANSAS