

NORTH DAKOTA STRATIGRAPHIC COLUMN



WINNIPEGOSIS SUMMARY

DRILL STEM TESTS AND PRODUCTION MAPPING

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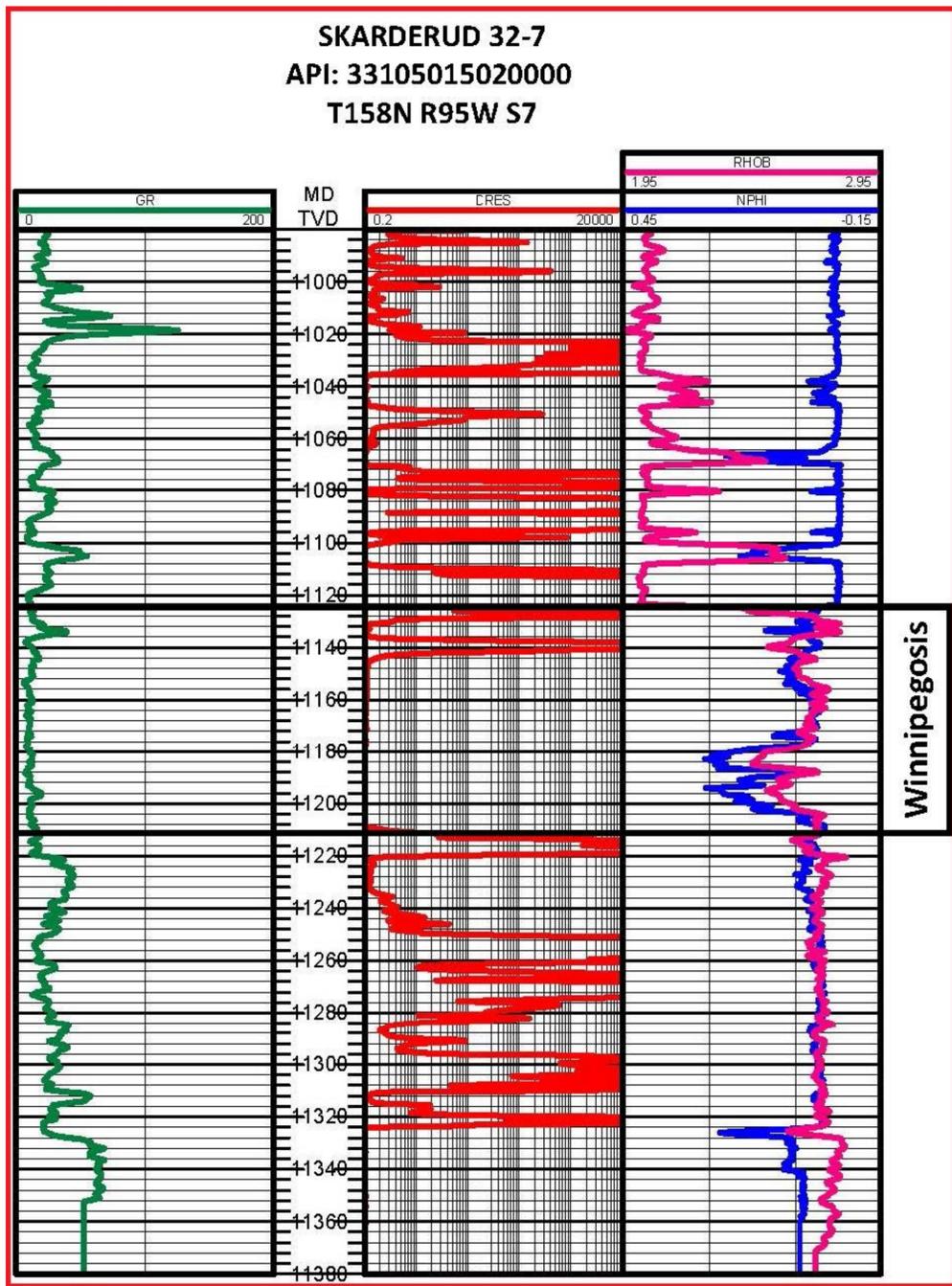
AGE MAY BE MILLIONS OF YEARS BEFORE PRESENT	ERATHEM	SYSTEM	SEQUENCE	ROCK UNIT		
				GROUP	FORMATION	MEMBER
0.01	QUATERNARY	Holocene	TEIAS	OAHE	RIVERDALE PICK CITY AGUE BROWN MELBARY ISLAND	
		Pleistocene		COLEHARBOR	WEST CENTRAL EASTERN RED RIVER VALLEY SIOUX FORKAL RIVER FALCONER BEET MICHIGAN SNOW SCHOOL DUMFRIES RED LAKE FALLS ROCKSHIRE VALLEY CROOKS PERRY ST. HILAIRE CANNON MADISON	
2.6	CENOZOIC	Pliocene	TEIAS	(Unnamed Unit)		
5.3		Miocene		ARIKAREE		
23.0		Oligocene		WHITE RIVER	BRULE CHADRON	SOUTH HEART CHALBY BUTTES
33.5	TERTIARY	Eocene	TEIAS	GOLDEN VALLEY	CAMELS BUTTE BEAR DEN	
55.8		Paleocene		FORT UNION	SENTINEL BUTTE BULLION CREEK SLOPE CANNONBALL LUDLOW	
65.5	MESOZOIC	CRETACEOUS	ZUNI	MONTANA	HELL CREEK BREEN COLGATE & LINTON BULLHEAD TIMBER LAKE TRULCITY	
					PIERRE	ODANAH DEGREY GREGORY PEMBINA GAMMON
					NIORRARA	
					CARLILE	
					GREENHORN	
					BELLE FOURCHE	
					MOWRY	
					NEWCASTLE	
					SKULL CREEK	
					INYAN KARA	
99.6	MESOZOIC	CRETACEOUS	ZUNI	DAROKTA	SWIFT RIERDON PIPERS BOWEN FLEMING TAMPECO KLINE PICARD POE DUNHAM	
145.5					JURASSIC	SACDE
201.4	MESOZOIC	TRIASSIC	ABSAHOKA	MINNELUSA	SPEARFISH MINNEKAHTA OPECHE BROOM CREEK AMSDEN ALASKA BENCH TYLER OTTER KIBBEY	
251.0					PERMIAN	CHARLES MISSION CANYON LODGEPOLE
299.0	MESOZOIC	PENNSYLVANIAN	KANSASIA	BIG SNOWY	BARREN THREE FORKS BIRDBEAR JEFFERSON DUPELOW	
318					CARBONIFEROUS	SOURIS RIVER DAWSON RAY PRAIRIE MOUSTHILL BELL BLAINE ESTERHAZY
359	PALEOZOIC	MISSISSIPPIAN	KANSASIA	MADISON	WYNNIPEGOSIS ASHERN	
416					DEVONIAN	INTERLAKE STONEWALL STONY MOUNTAIN GUSTON STOUGHTON
444	PALEOZOIC	SILURIAN	TIPPECANOE	BIG HORN	RED RIVER ROUGHLÖCK ICEBOX WINNIPEG BLACK ISLAND	
488					ORDOVICIAN	DEADWOOD
542	PALEOZOIC	CAMBRIAN	SAUK	WINNIPEG	WYOMING PROVINCE TRANS-HUDSON OROGEN SUPERIOR PROVINCE	
542					PRECAMBRIAN	

In order to better facilitate petroleum exploration and development in the Williston Basin, the North Dakota Geological Survey (NDGS) has published a series of production-related maps and corresponding data sets. These maps sets include production and drill stem test (DST) results with an accompanying spreadsheet for easy data extraction. The primary goal of this project is to create a database showing the distribution of hydrocarbons within each productive unit.

Prior to this project, over 55% of the DST results in the state did not have an associated geologic interval. The NDGS utilized a series of filters in Petra and Excel to unite formation tops with DST results. Now over 95% of DST results are associated with a geologic interval. After removing failed (misrun) DSTs, the remaining DST results were then separated into three groups. The first group (Positive DSTa) contains wells that have recovered oil or gas (in either the drill pipe or the sampler), or those that list oil or gas as the primary component of the fluid/gas mixture (e.g. 10' mud cut oil) in the description. Secondly, Positive DSTb wells display results for oil or gas as the secondary component of the fluid/gas mixture (e.g. 50' gas cut mud). Although Positive DSTb wells do show signs of hydrocarbons, the hydrocarbon signal is considered weaker than those in the Positive DSTa group. Lastly, the Negative DST results have no indication of hydrocarbons. Detailed information for each DST (time-pressure data, interval depths, fluid and gas recovery information) can be accessed through the well file database maintained by the North Dakota Industrial Commission (NDIC) Oil and Gas Division.

Production for each well was determined using the NDIC's Production Pools and associated monthly production totals. The production pools utilized are shown on the Production Map for each interval. Cumulative production for each well was calculated through September 2019.

This project is a summary of the Winnipegosis Formation's production and drill stem test results. Map sets include a production map, cumulative production map and DST results in North Dakota's portion of the Williston Basin. The Winnipegosis Formation is highlighted by the red box on the North Dakota Stratigraphic Column on the left. A representative log of the Winnipegosis Formation is shown below along with a map showing the well's approximate location.



References

Murphy, E.C., Nordeng, S.H., Juenker, B.J., and Hoganson, J.W., 2009, North Dakota Stratigraphic Column, North Dakota Geological Survey, MS-91, 1p.

North Dakota Industrial Commission, Department of Mineral Resources, Oil and Gas Statistics, retrieved October 2019, <https://www.dmr.nd.gov/oilgas/>

NORTH DAKOTA LOCATION MAP

