NORTH DAKOTA

S	TRATIGRAPHIC COLUM							
YEARS	HEM	5	SY	STEM	NCE	ROCK UNIT		
AGE MILLIONS OF YEARS BEFORE PRESENT	ERATHEM	51			SEQUENCE	GROUP	FORMATION	MEMBER
M B	[<u>H</u>]			Holocene			OAME	RIVERDALE PICK CITY
-0.01-		QUATERNARY		Holocene	TEJAS	COLEHARBOR	OAHE WEST CENTRAL EAST	AGGIE BROWN MALLARD ISLAND ERN RED RIVER VALLEY SHERACK
				Pleistocene			SNOW SCHOOL DAHLEN	POPLAR RIVER BRENNA FALCONER HUOT ARGUSVILLE WYLIE RED LAKE FALLS
-2.6-							SNOW SCHOOL BAHLEN GARDAR HORSESHOE VALLEY CHURCH. MEDICINE HILL CAMP GR CANDO	S FERRY ST. HILAIRE AFTON MARCOUX
-5.3-			NEOGENE	Pliocene			(Unnamed Unit)	
- 23.0 - - 33.9 -	D		IN	Miocene Oligocene		WHITE RIVER	ARIKAREE BRULE	
00.0	CENOZOIC			Eocene	~~	~~~~~	CHADRON	CAMELS BUTTE
- 55.8 -	ENO	RY	GENE			FORT UNION	GOLDEN VALLEY	BEAR DEN
	CJ	TERTIARY		PALEOGENE Paleocene			SENTINEL BUTTE	
			PALEO				BULLION CREEK	
							SLOPE	
							CANNONBALL	
-65.5-							LUDLOW	
		CRETACEOUS		Upper	ZUNI	MONTANA	HELL CREEK	BREIEN
							FOX HILLS	COLGATE ≷ LINTON BULLHEAD TIMBER LAKE TRAIL CITY
							PIERRE	ODANAH
								DEGREY
								GREGORY PEMBINA
								GAMMON
	C						NIOBRARA	
	MESOZOIC					COLORADO	CARLILE GREENHORN	
- 99.6 -	ESC						BELLE FOURCHE	
00.0	M					DAKOTA	MOWRY NEWCASTLE	
							SKULL CREEK	
-145.5-							INYAN KARA	
							SWIFT	
							RIERDON	
		JURASSIC					BOWES FIREMOON TAMPICO	
201.0							PIPER	KLINE PICARD POE DUNHAM
- 201.6 - - 251.0 -		TRIASSIC			~		SPEARFISH	SAUDE
							MINNEKAHTA	PINE BELFIELD
		P		ERMIAN	ABSAROKA		оресне	
200.0						MINNELUSA	BROOM CREEK	
- 299.0 -				PENNSYLVANIAN			AMSDEN	ALASKA BENCH
-318-						~~~~	TYLER	
						BIG SNOWY	OTTER KIBBEY	
		orre	SOC				GWA DY DG	
		ATERD	ONIFER				CHARLES	
		CARBONIFEROUS		MISSISSIPPIAN	KASKASKIA	MADISON	MISSION CANYON	
							LODGEPOLE	
— 359 —	OIC						BAKKEN THREE FORKS	
	PALEOZOIC					Depart	BIRDBEAR	
						JEFFERSON	DUPEROW	
	P		D	EVONIAN		MANITOBA	SOURIS RIVER DAWSON BAY	
					~~	ELK POINT	PRAIRIE	MOUNTRAIL BELLE PLAINE
							WINNIPEGOSIS	ESTERHAZY
-416 -							ASHERN	~~~~
			S	SILURIAN			INTERLAKE	
– 444 –							STONEWALL	
					TIPPECANOE	BIG HORN	STONY MOUNTAIN	GUNTON STOUGHTON
					TII	BIG HORN	RED RIVER	
			ORDOVICIAN				ROUGHLOCK	
					~~	WINNIPEG	BLACK ISLAND	~~~~
							DEADWOOD	
- 488 -			CA	MBRIAN	SAUK			
-542 -					~		TRUCTURAL PROVIN	
		I	PREC	CAMBRIAN		WYOMING PROVINCE	TRANS-HUDSON OROGEN	SUPERIOR PROVINCE
ı								

North Dakota Geological Survey Geologic Investigations No. 240

TYLER SUMMARY

Edward C. Murphy, State Geologist Lynn D. Helms, Director Dept, Mineral Resources

DRILL STEM TESTS AND PRODUCTION MAPPING

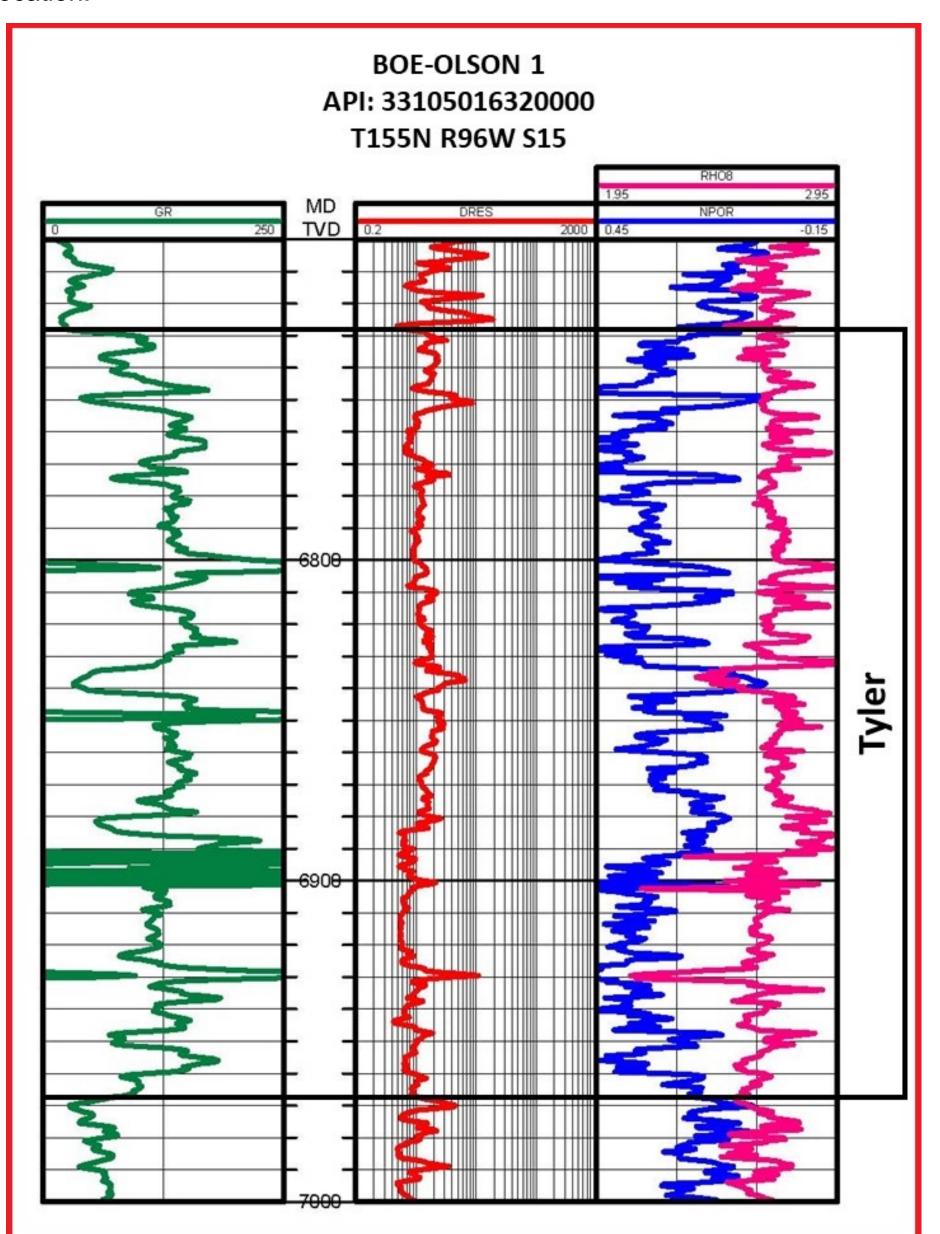
Travis D. Stolldorf 2020

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 Tyler 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 Tyler Formation is highlighted by the red box on the North Dakota Stratigraphic Column on the left. A representative log of the Tyler Formation is shown below along with a map showing the well's approximate location.

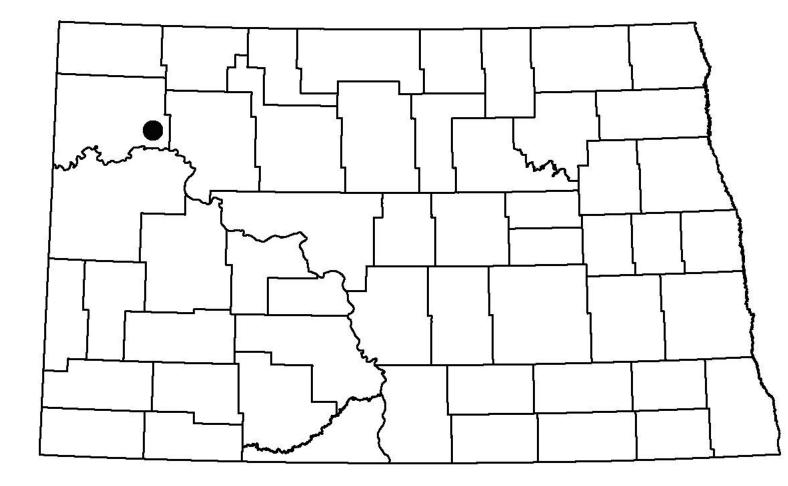


References

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/

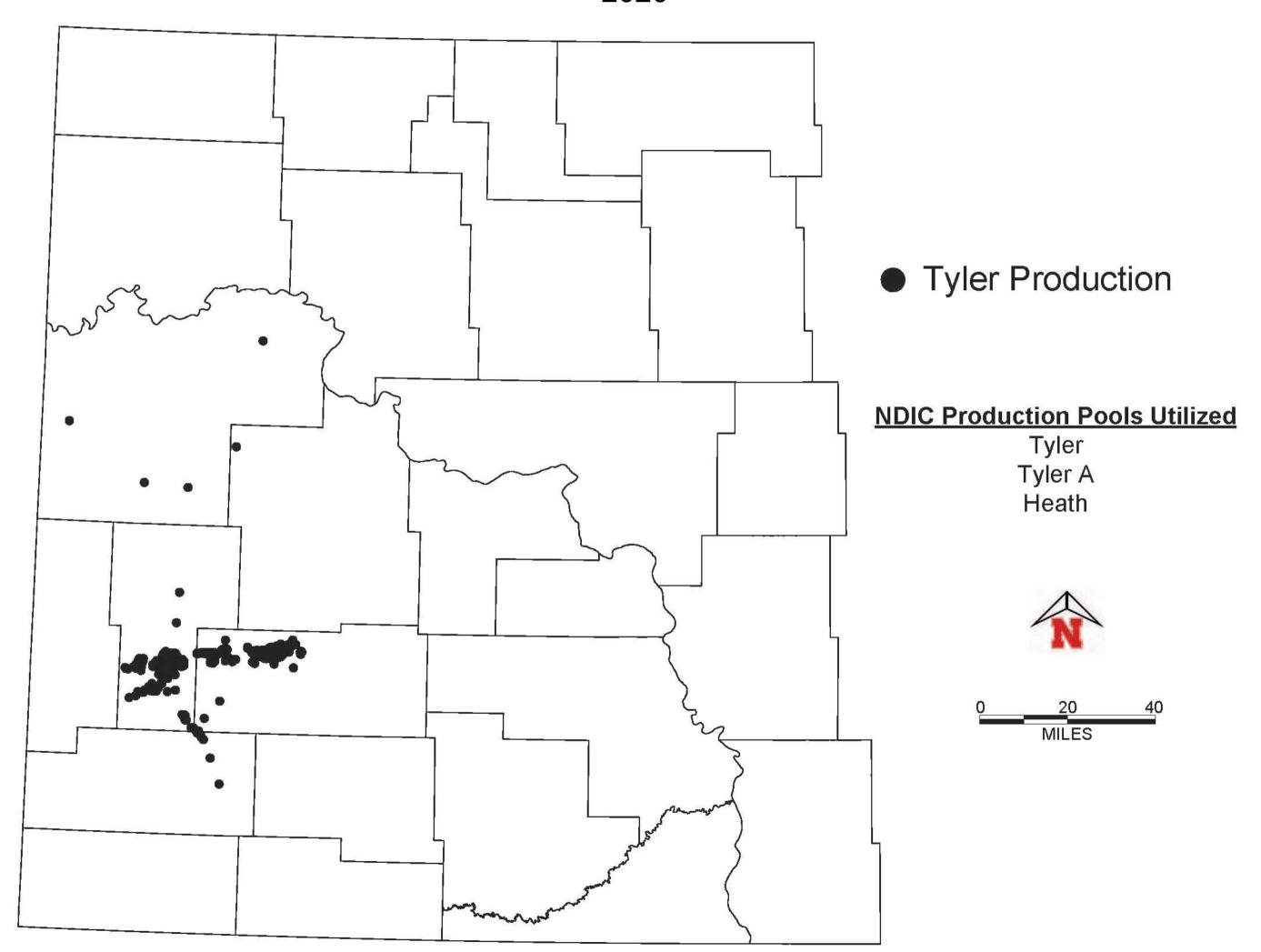
NORTH DAKOTA LOCATION MAP





TYLER OIL PRODUCTION

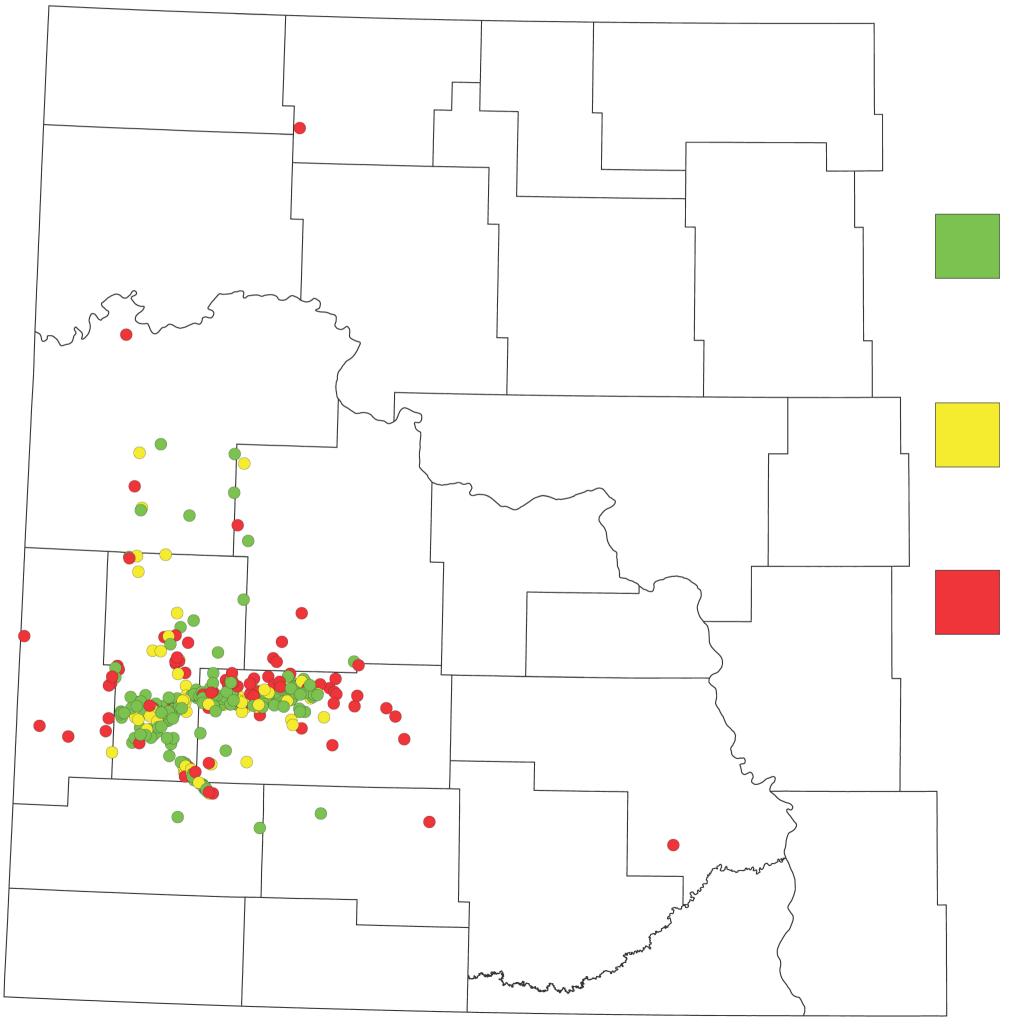
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TYLER DRILL STEM TEST RESULTS



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POSITIVE DSTa

- (1) Oil or gas recovered in sampler and/or pipe (e.g. 275' Free Oil)
- (2) Description with oil or gas as the primary component of fluid/gas mixture (e.g. 150' mud cut Oil)

POSITIVE DSTb

- (1) Description with oil or gas as the secondary component of fluid/gas mixture (e.g. 150' Gas cut mud)
- (2) Hydrocarbons present but a weak indication in DST

NEGATIVE DST

(1) No Oil or Gas reported





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TYLER CUM OIL PRODUCTION

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