### PROJECT BACK TO THE FUTURE

# Agricultural Land Valuation in Mountrail County, ND







### Starting out...

What is very unique about this picture?

► Hint – Apollo 11 'Eagle' lunar lander returning to command module from the historic first moon walk

✓ The astronaut who took this photo – command module pilot Michael Collins, is the only human, alive or dead that isn't in the frame of this picture, 1969



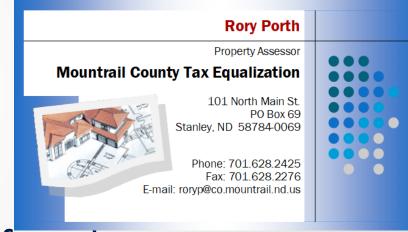
### **Introduction - Our Journey**

- Quick Bio
  - Class 1 Property Assessor in Mountrail County relatively new to role
  - Previously complex systems integrator / consultant

Certified Information Systems Auditor (CISA) – ISACA – Information Systems

**Audit and Control Association** 

- Where / what is Mountrail county?
- A few pictures
- "The Bakken" oil & natural gas production
- Ag Land Valuation a little history and lots of work
  - Maps, numbers, spreadsheets
- What we did and where we are



### OK... the 'fam'...



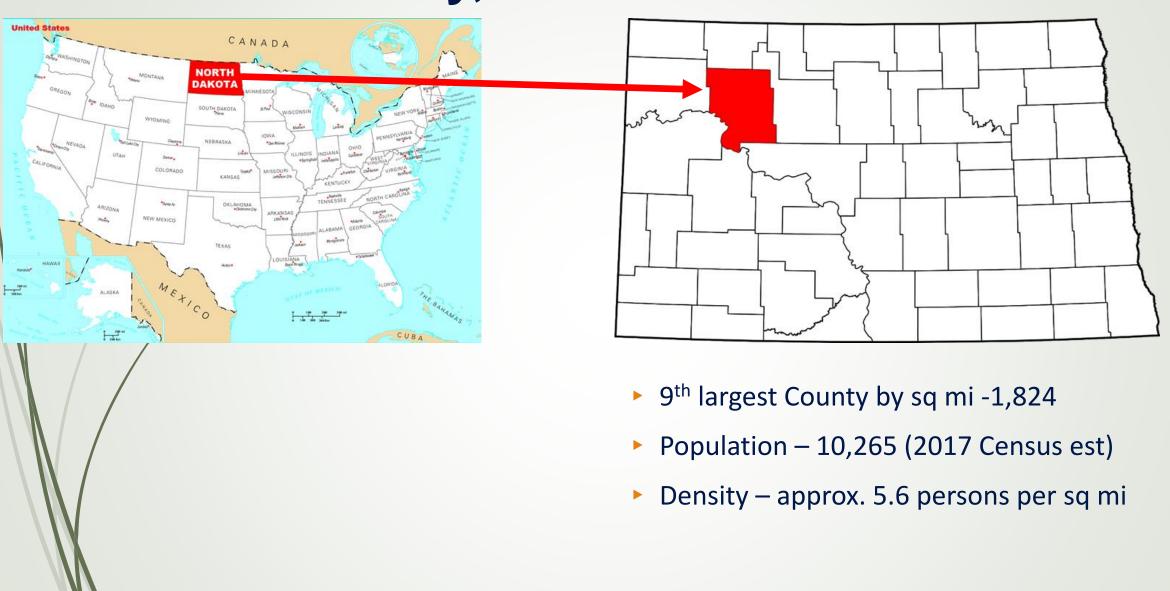








### Mountrail County, North Dakota



### What does Mountrail look like?

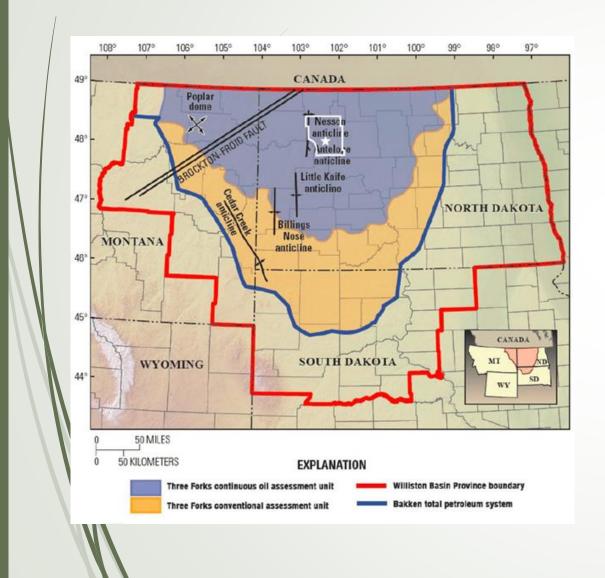


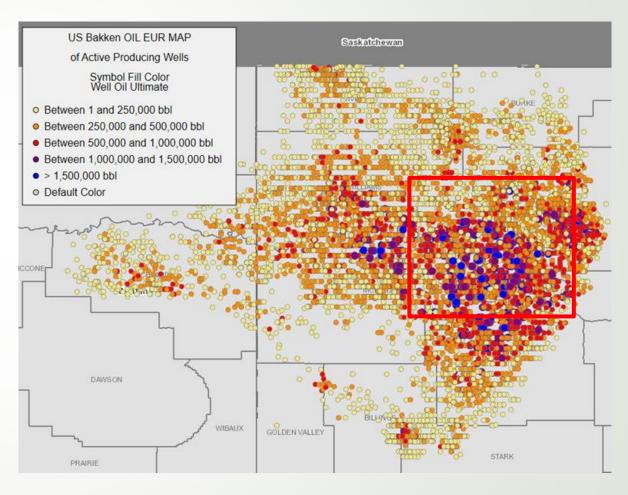


### What does Mountrail look like?

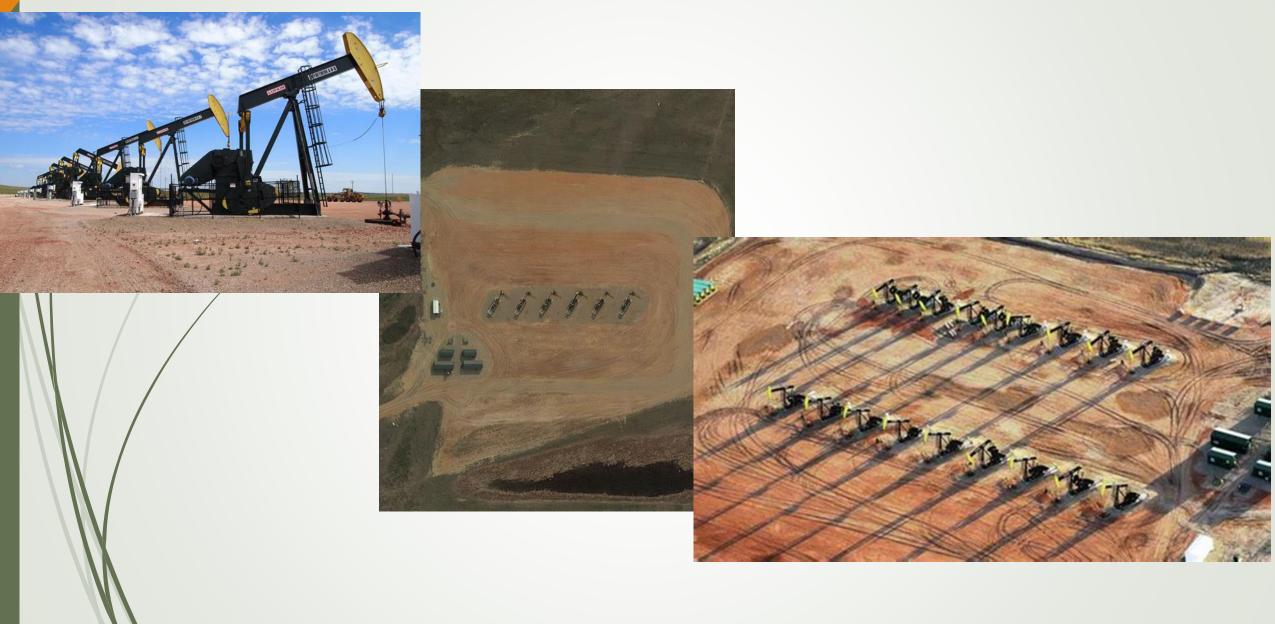


# The Bakken - North Dakota is #2 Oil Producer in US





### The Bakken



### Winter Temps... Uffda..







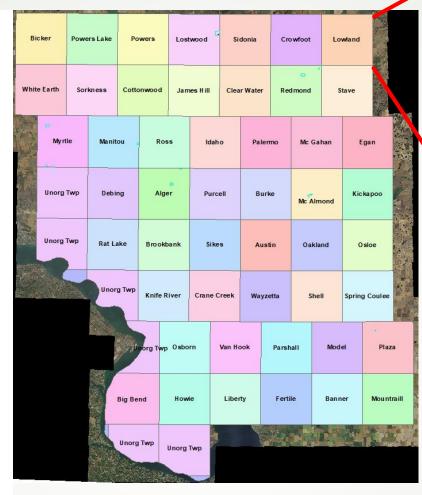
### Valuation in Mountrail - 2018 Values

Assessment Code*	Description	Parcels	Parcel %	True & Full Value	Value %
101	Agricultural	8,946	59.3%	\$462,571,200	29.3%
201	Residential	3,331	22.1%	\$385,144,700	24.4%
233	Commercial	880	5.8%	\$694,445,700	44.0%
250	Vacant Land	1,931	12.8%_	\$37,875,100	2.4%
	Total	15,088	_	\$1,580,036,700	

<sup>\*</sup>NOTE: Centrally assessed properties are not included in the list

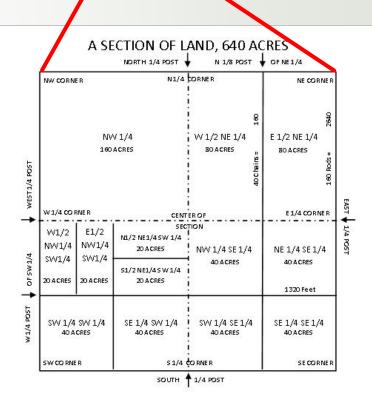
### **Some Land Definitions**

- <u>County</u>-largest administrative division of a state.
- Township-An approximately thirty-six-square mile division of land used in the Federal Rectangular Survey System.
- Section-A unit of land approximately one mile square and normally containing 640 acres, as laid out by the government survey.
- Parcel-A contiguous area of land described in a single legal description or as one of a number of lots on a plat



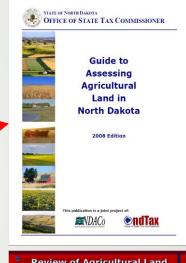
55 Townships in Mountrail County

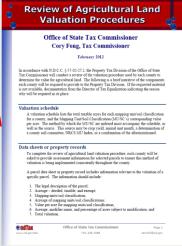
1	6	5	4	3	2	1	N↑
	7	8	9	10	11	12	
	18	17	16	15	14	13	SECTIONS
	19	20	21	22	23	24	
	30	29	28	27	26	25	
	31	32	33	34	35	36	



### **Ag Land Valuation - Basically Two Methods**

- Must be based on soil type detailed or general
  - Soils information from NRCS National Resources Conservation
     Service US Dept. of Agriculture
  - Implement NDSU average values by NRCS soil type for Agricultural land valuation
  - State Tax Dept. Ag Land valuation guide & Certification guide
- ▶ 1. "Breakpoint" generalized use "Productivity Index"
  - Better quality soils considered "cropland"
  - Lower quality soils considered "non cropland"
  - Much Simpler to implement
- 2. "Actual Ag Land Use" use GIS to map land use acres + Productivity Index-Soils
  - More complex and time consuming to implement most precise





### North Dakota Ag Land Valuation Overview

**ND Tax Dept** 



NDSU Ag Values

"Capitalized average annual gross return" 2019 Average Ag Land Values

NDSU Ag Land Production Value 2018

<u>Average Ag - \$454.62</u>

Cropland - \$692.46

NonCrop - \$156.54

How much to Where?

**Problem: How to make Allocation Equitable?** 

Need to know how many crop and noncrop acres, other types of land



Mountrail Ag
Acres

1,048,451.07

X \$454.62

Ag Acre Total Value \$476,646,825 at 100% Threshold

### "Breakpoint Method" - 2017 Valuation

Bette	r Soils	Productivity Index (PI) or AUM (noncrop)	Land Valuation – "Cropland"	Land Valuation – "NonCrop"	2017 Ag Values Average Ag - \$458.53	
		95	\$917	N/A	Crop - \$678.66	<b>†</b>
		90	\$880	N/A	NonCrop - \$147.91	
$\setminus$		80	\$770	N/A		
$  \setminus  $		70	\$688	N/A		
M		60	\$578	N/A		
		50	\$486	N/A	Breakpoint	Cropland
		49	N/A	\$217		Non-
		40	N/A	\$178	Note the	Cropland
		30	N/A	\$132	Difference	
\ \\ \	7	20	N/A	\$89	between Soil	
Poore	er Soils	10	N/A	\$40	Types - \$269	<b>↓</b>
W		0	N/A	\$15		

# 2017 Breakpoint Method Implemented – Processed New Ag Land Values

- Different method for the county changed historical Ag Land values
- Updated 8,900+ parcels
- ▶ ND "Notice of Increase" approx. 3,000 letters sent out
  - ▶ \$3,000+ increase in valuation AND 10% or more of previous value
- Minimal communication with public one small article in paper
  - ▶ (our "bad")
- Result?
- Confusion, some angst, some happy some \*VERY\* unhappy vocally...

### Contention!

May 10, 2017 Paper

#### ATTENTION MOUNTRAIL **COUNTY LANDOWNERS!** Do Your 2017 Farmland Valuations Make Sense?

Sign our petition today at

#### https://www.ipetitions.com/petition/reverse-mountrail-countys-taxation-method

The petition reads: "We, the undersigned, call on Mountrail County Commissioners to continue to use 2016 farmland valuations until: 1. A new valuation method is developed based on actual land use as cropland or non cropland. 2. A Soils Committee is formed to recommend tax assessment methods to the county commission."

The site is easy to use, just follow the instructions

Let your voice be heard concerning proposed changes in taxable valuations in Mountrail County.

Voice your concerns, not only by signing the petition, but also call your County Commissioners and attend the Commissioners Meeting on Tuesday. May 16 at noon at the Courthouse in Stanley

ship met with the Board to discuss the soil implementation. Also present from the Tax Directors Office was Rory Porth, Assessor and Teresa Captain, Deputy Tax Director. Fred Evans stated the County is not utilizing the implementation of soils correctly and feels usage should be utilized.

Charlie Sorenson suggested a soil board be created that would make suggestions to the Tax Director's Office. Charlie Sorenson stated the land should be split into pasture vs crop land.

Assessor Porth explained that the surrounding counties are following the same procedures.

States Attorney Enget stated that modifiers are not dead but it does have to be approved by the state before implementation and the assessing rules come from the legislation.

#### May 24, 2017 Paper

Landowners Ouestion 2017 Taxable Valuations



able valuations on agricultural land, in the past years non-cropland and some landowners in Mountrail County have been expressing their concerns to County Commissioners.

Since receiving their new tax- land use. He says that it appears that while good value cropland has been

Landowner Charlie Sorenson ad dressed the commission saying they grasslands have been valued too low, will keep coming back to the meetings as they believe it is important to

There clearly are some flawed issues with the Revised/Proposed Taxation of Land in Mountrail County.

We see the main Problem is land use, assessing crop-land and non-cropland the same.

The ND Century Code is very clear on landuse and how it is to be dealt with.

Concerned citizens can do two things:

1. Sign the petition on-line (ipetitionmountrailcounty) it will pop up. It asks to continue 2016 tax rate for 2017 and start a five member soil committee.

No need to donate!

2. Come to the Mountrail County Commissioners meeting on June 6th, 9:00 a.m. and Tax Equalization meeting at 10 a.m. Be ready to hear people share their concerns, along with being ready to share your concerns.

Paid for by Charlie Sorenson and Fred Evans

#### May 31, 2017 Paper

#### IT'S THE LAW

The assessor shall apply "Actual use of the property for cropland or noncropland purposes by the owner of the parcel" (subsection 8 of NDCC 57-02-27.2)

2017 valuations of agricultural property in Mountrail County do not consider use and have been made in direct violation of this law.

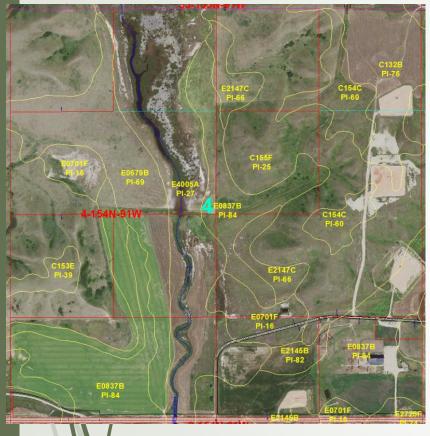
#### Persuade Mountrail County Commissioners to change direction

Attend the Mountrail County Equalization Meeting on Tuesday, June 6th at 10:00 a.m. at the courthouse.

Search online "ipetitions Mountrail County" and sign our petition

### **Ag Land Valuation**

**Example Section** 

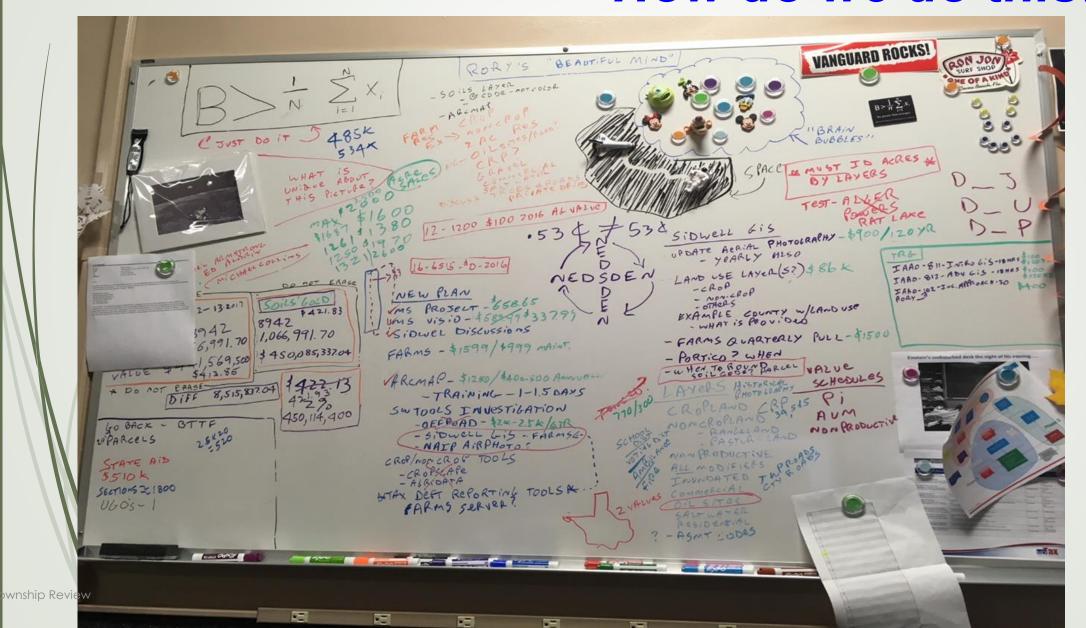


- Each parcel has various soil types within it
- Each soil type has a "Productivity index" associated
- Higher Pl's = better soil
- Higher Pl's have higher \$ value applied, lower Pl's have a lower \$ value applied
- ► 2017 Mountrail used ND State approved 'breakpoint method' in setting values did not use actual use
- June 2017 County Board of equalization voted to utilize <u>actual land use</u> for valuation

WENT <u>BACK</u> TD 2016 LAND VALUES FOR THE <u>FUTURE</u> OF ACTUAL LAND USE

### Two Years Ago....

### "How do we do this....?"



Actual Land Use - Bounding the Problem

#### Much to keep track of:

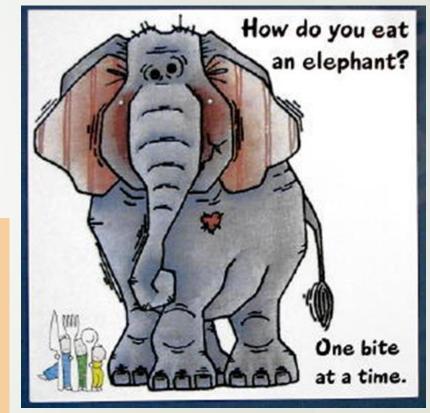
- Mountrail County Comprised of
  - ► 55 Townships 7 cities
  - ▶ 1,803 Sections
  - ► 1,048,451.07 Ag related acres
  - 8,946 Ag related parcels
  - 2,200 Ag related parcel owners
  - 147 Soils Codes \$ values applied
    - Where are those soils?
- How is each parcel being used?
  - Cropland
  - Non-Cropland
  - Farmstead
  - Commercial
  - Gravel Pit
  - Roads
  - Oilwell Sites
  - Saltwater disposal



Answer? – utilize a GIS system

Problem – we were <u>VERY</u> new to GIS

Education needed – our office <u>AND</u> our constituents



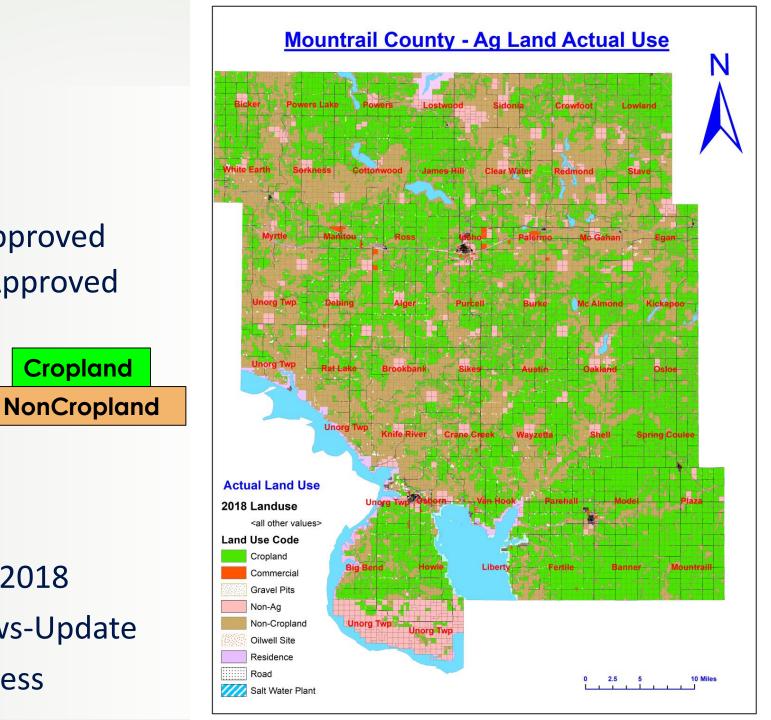
### **Project Plan**

- GIS Software in House ArcMAP
  - ArcMap Publisher, Sidwell FARMS
- Soils Committee Formed
- **Drawing Ruleset** Defined and Approved
- Valuation Ruleset Drafted and Approved

Cropland

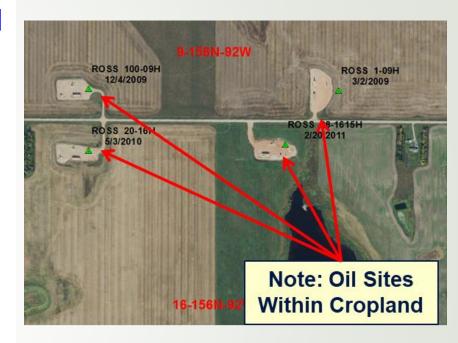
- All phases start July 2017
  - 3 Sections "Pre-Pilot"

  - Pilot Section
  - Drawing by Tier
- Tier Deliveries Started Fall 2017
- Total Tier county delivery Feb 2018
- 2017 Aerial Photography Reviews-Update
- Used for 2019 Equalization Process



### **Drawing Ruleset Example - Oilwell Sites**

- ► ND Century Code "Ag property used for oil, natural gas, or subsurface minerals must continue to be assessed as Ag property for the remainder...."
- Challenge: Was it cropland or noncropland before?
  - Some parcels found oil sites partially on crop land, partially on non-cropland
  - Very difficult to manage acres
- ► Simplified Approved Decision all oil site acreage will be valued as non-cropland based off soil types underneath oil site (includes road leading to oil site)



#### Land Used for Extraction of Oil, Natural Gas, or Subsurface Minerals

Land that was assessed as agricultural property at the time the land was put to use for extraction of oil, natural gas, or subsurface minerals as defined in N.D.C.C. § 38-12-01 must continue to be assessed as agricultural property if the remainder of the surface owner's parcel of property on which the subsurface mineral activity is occurring continues to qualify for assessment as agricultural property under subsection 1 of N.D.C.C. § 57-02-01.



### **Land Valuation Ruleset**

GIS Item	Valuation Method
Cropland	Cropland values - Productivity Index (PI)
Non Cropland	Noncrop values – based off AUM (Animal Unit Month) calculation (lbs air dry forage x 0.25 / 913 lbs/month = AUM/ac)  Ex. 2000lbs forage x 0.25=500lbs / 913 = 0.55 AUM/ac
Farmsteads	Noncrop values
Oilwell Sites	Noncrop values
Salt Water Wells	<ol> <li>Commercial wells @ Commercial Values (Tax Dept)</li> <li>Private Wells @ Noncrop values</li> </ol>
Taxable Rural Residence	2 Acres at \$2,000 / acre
Roads	<b>\$0 for Right-of-Way acreage</b> of TWP Certified Roads, County Roads, State Highways
Commercial Land / Structures	Commercial Values (Tax Dept)
Gravel Pits	Commercial Values (Tax Dept)
Non-Ag (vacant land)	Vacant Land Values (Tax Dept)

### What it looks like...

- Left Section with NRCS Soil Layer
- Right Same section with Actual Use drawn in
- Types Cropland, non-cropland, Residential, Roads, Oil Sites, others





Note Portion Of Oil Well site Envisioning Data .... An Idea! NRCS Soils Info

Map unit symbol	Map unit name	ΡI	Acres in AOI
C2A	Tonka silt loam, 0 to 1 percent slopes	42	5,040.90
СЗА	Parnell silty clay loam, 0 to 1 percent slopes	20	20,932.00
C5A	Southam silty clay loam, 0 to 1 percent slopes	5	12,561.50
C6A	Tonka-Parnell complex, 0 to 1 percent slopes	80	22.2
C64C	Wamduska, west-Mauvai complex, 1 to 9 percent slopes	32	15
C75A	Vallers loam, moderately saline, 0 to 1 percent slopes	37	3,237.70
C132B	Williams-Zahl loams, 3 to 6 percent slopes	76	168,009.50
C132C	Williams-Zahl-Zahill complex, 6 to 9 percent slopes	56	99,634.10
C135C	Zahl-Williams-Zahill complex, 6 to 9 percent slopes	56	1,706.80
C135D	Zahl-Williams loams, 9 to 15 percent slopes	43	201,198.10
C148C	Williams-Zahl-Parnell complex, 0 to 9 percent slopes	51	104.6
C149B	Williams-Bowbells-Tonka complex, 0 to 6 percent slopes	79	475.8
C153E	Zahl-Max loams, 15 to 25 percent slopes	39	4,003.70
C154C	Zahl-Williams-Bowbells loams, 3 to 9 percent slopes	60	122,042.40
C155E	Zahl-Max-Arnegard loams, 9 to 25 percent slopes	36	400.2
C155F	Zahl-Max-Arnegard loams, 15 to 60 percent slopes	25	28,940.40



### Soil Code 'Productivity Index'

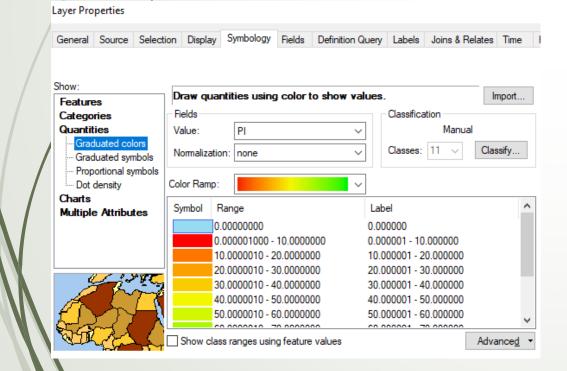
North Mountrail County with NRCS Soils Layer

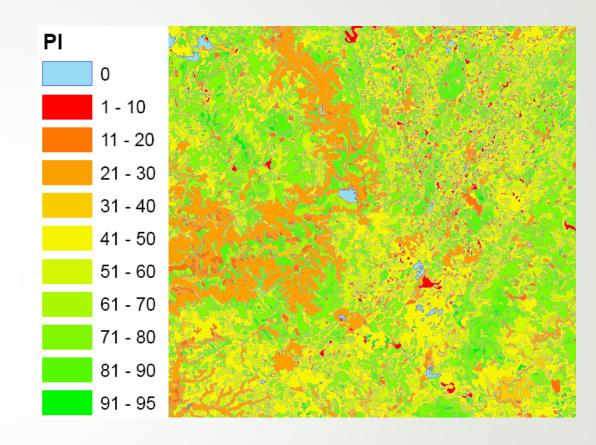


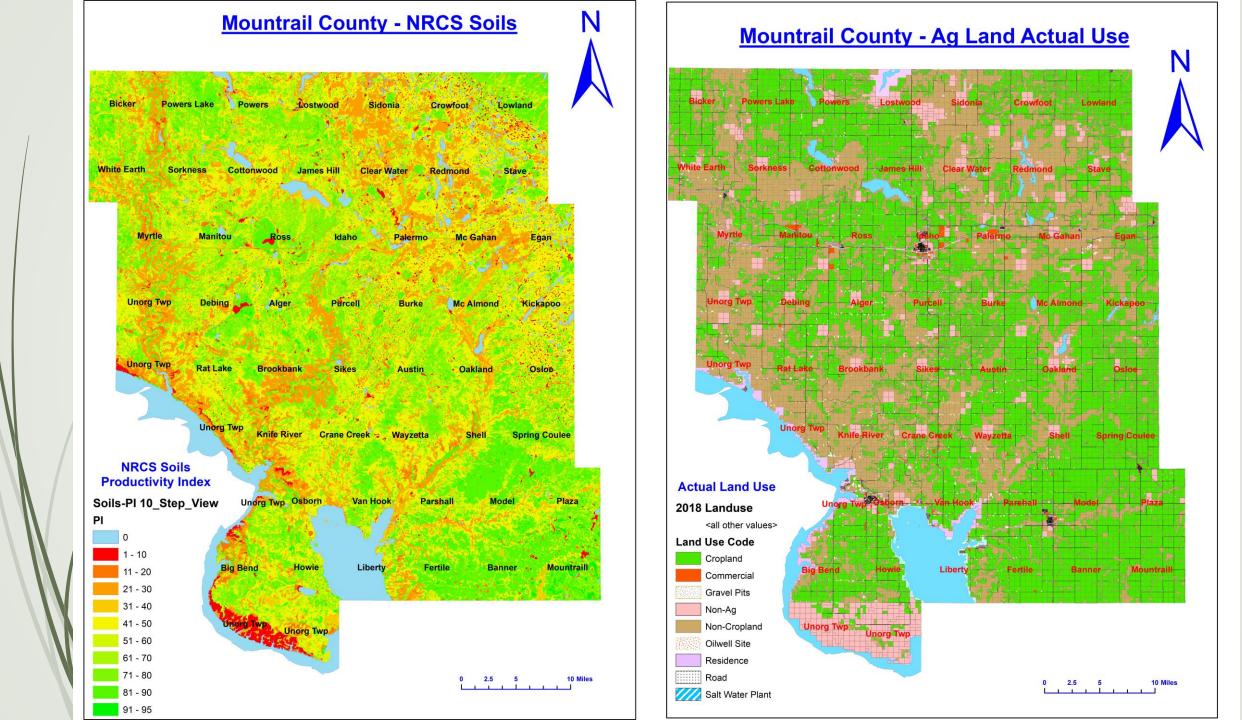
Map unit symbol	Map unit name	PI	Acres in AOI
C2A	Tonka silt loam, 0 to 1 percent slopes	42	5,040.90
СЗА	Parnell silty clay loam, 0 to 1 percent slopes	20	20,932.00
C5A	Southam silty clay loam, 0 to 1 percent slopes	5	12,561.50
C6A	Tonka-Parnell complex, 0 to 1 percent slopes	80	22.2
C64C	Wamduska, west-Mauvai complex, 1 to 9 percent slopes	32	15
C75A	Vallers loam, moderately saline, 0 to 1 percent slopes	37	3,237.70
C132B	Williams-Zahl loams, 3 to 6 percent slopes	76	168,009.50
C132C	Williams-Zahl-Zahill complex, 6 to 9 percent slopes	56	99,634.10
C135C	Zahl-Williams-Zahill complex, 6 to 9 percent slopes	56	1,706.80
C135D	Zahl-Williams loams, 9 to 15 percent slopes	43	201,198.10
C148C	Williams-Zahl-Parnell complex, 0 to 9 percent slopes	51	104.6
C149B	Williams-Bowbells-Tonka complex, 0 to 6 percent slopes	79	475.8
C153E	Zahl-Max loams, 15 to 25 percent slopes	39	4,003.70
C154C	Zahl-Williams-Bowbells loams, 3 to 9 percent slopes	60	122,042.40
C155E	Zahl-Max-Arnegard loams, 9 to 25 percent slopes	36	400.2
C155F	Zahl-Max-Arnegard loams, 15 to 60 percent slopes	25	28,940.40

### Soil Code by NRCS Productivity Index

- Symbology PI Breakdown
  - 0-Blue-Water
  - PI 10 Step Color change
  - Above 50 varying shades of green



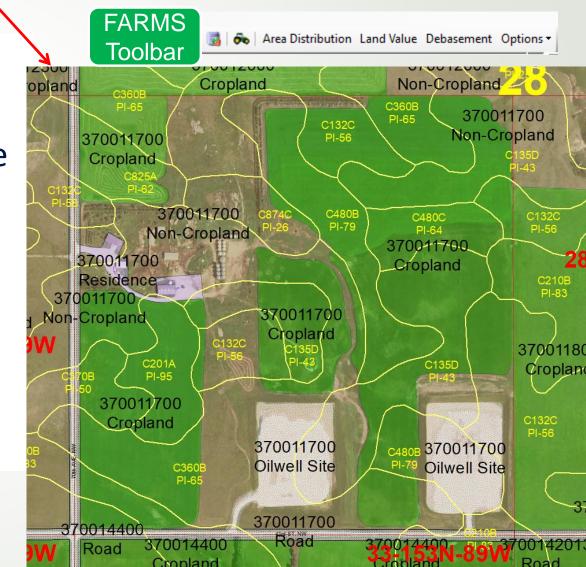




### FARMS Processing – FARMS Program

Sample Parcel - SW 1/4 Section

- Cropland, noncrop, Residence, Oil Site, Roads
- Utilizes Soil Types within Actual Land use
- "Slices" Actual Land use and Soil Type layers into acres – used for valuation
- Plenty of data provided
  - ► This parcel 32 rows
  - Entire county 107,671 rows



**Detailed Acreage Reporting** 

Land Use

Commercial

Cropland

**Gravel Pit** 

Non-Ag

NonCrop

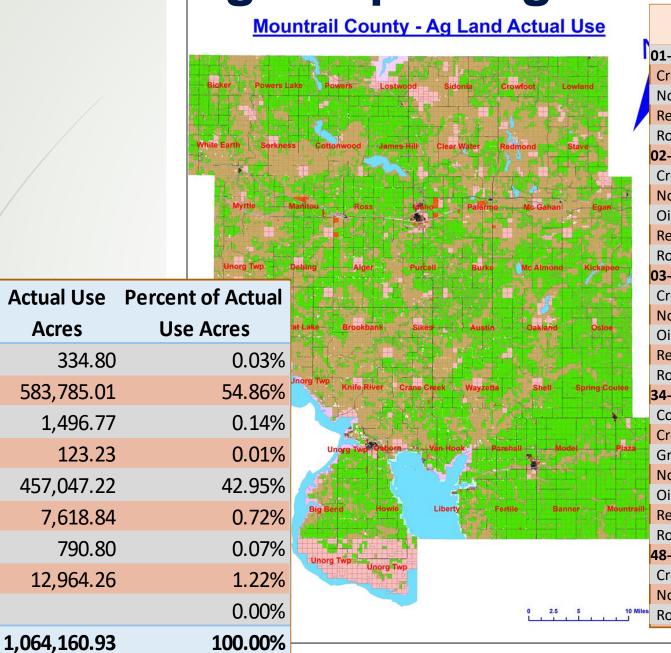
Oilwell Site

Residence

**Grand Total** 

Road

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Land Use	Actual Use Acres	Percent of Actual Use Acres
01-Lowland 158-88	Acres	Use Acres
Cropland	16,906.39	15.67%
NonCrop	4,837.26	4.48%
Residence	3.97	0.00%
Road	343.95	0.32%
02-Crowfoot 158-89	343.33	0.3270
Cropland	10,858.88	10.06%
NonCrop	10,366.88	9.61%
Oilwell Site	17.07	0.02%
Residence	7.32	0.01%
Road	250.69	0.23%
03-Sidonia 158-90	230.03	0.23/0
Cropland	4,662.05	4.32%
NonCrop	15,002.39	13.90%
Oilwell Site	98.18	0.09%
Residence	5.95	0.01%
Road	200.89	0.19%
34-Rat Lake 154-93	200.03	0.1370
Commercial	6.04	0.01%
Cropland	8,380.50	7.77%
Gravel Pit	60.42	0.06%
NonCrop	12,473.27	11.56%
Oilwell Site	295.64	0.27%
Residence	11.24	0.01%
Road	206.27	0.19%
48-Mountrail 151-88	200.27	0.1370
Cropland	19,619.87	18.18%
NonCrop	2,959.16	2.74%
Road	334.56	0.31%
T.Odd	334.30	0.5170

### Soils Valuation Actual Land use – 2019 Values

**Non-Crop** 

AUM

\$380

\$342

\$295

\$270

\$228

\$192

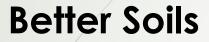
\$152

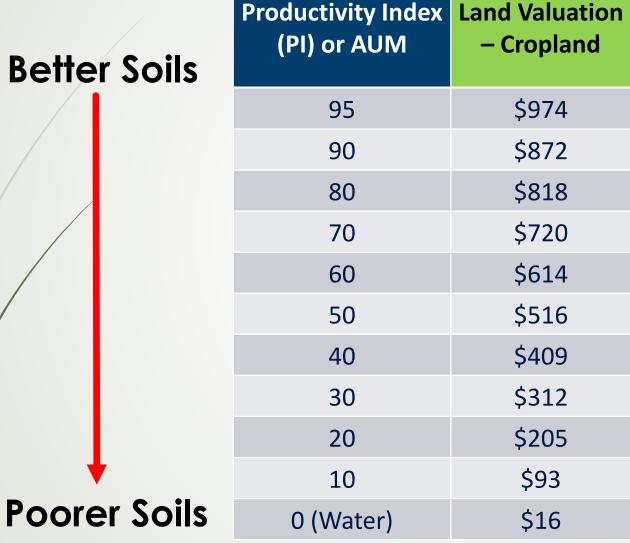
\$114

\$76

\$38

\$16





#### 2019 Values

NDSU Ag Land **Production Value** 

**Average Ag - \$454.62** 

Cropland - \$692.46 NonCrop - \$156.54

## FARMS processed and overall Ag Land Values

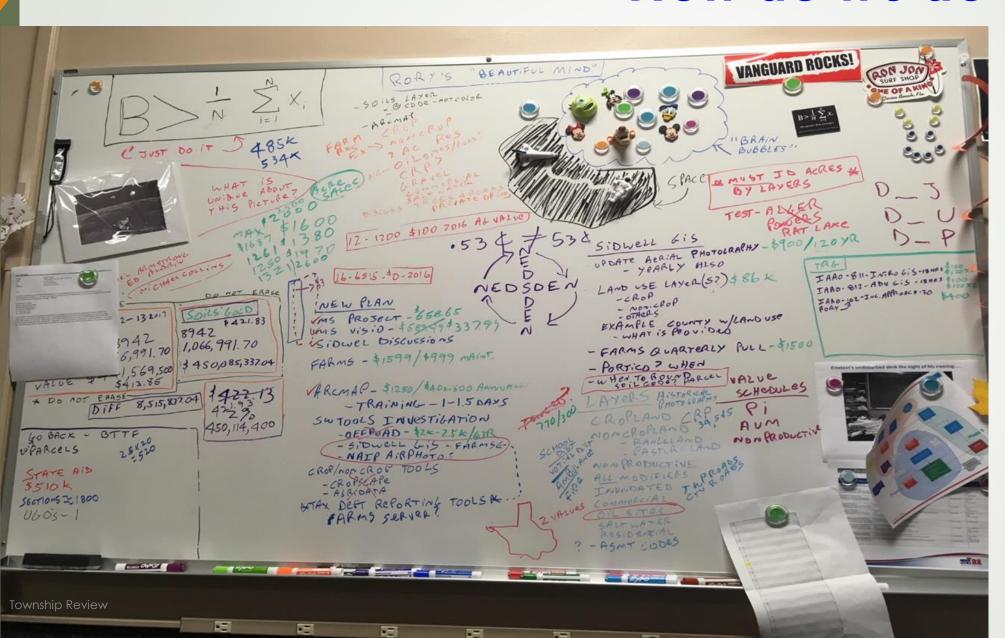
Land Use	Actual Use Acres	Percent of Actual Use Acres	Total Value	Percent of Total Value
Commercial	334.80	0.03%	\$0	0.00%
<b>Cropland</b>	583,785.01	54.86%	\$391,166,486	84.57%
Gravel Pit	1,496.77	0.14%	\$0	0.00%
Non-Ag	123.23	0.01%	\$0	0.00%
NonCrop	457,047.22	42.95%	\$70,201,573	15.18%
Oilwell Site	7,618.84	0.72%	\$1,184,966	0.26%
Residence	790.80	0.07%	\$0	0.00%
Road /	12,964.26	1.22%	\$0	0.00%
(blank)		0.00%		0.00%
<b>Grand Total</b>	1,064,160.93	100.00%	\$462,553,026	100.00%

\*Note: Only Ag Related Acres are valued

	Actual Use	Percent of Actual	
Land Use	<b> ∡</b> Acres	Use Acres	Total Value
<b>□ 01-Lowland 158-88</b>	3		
Cropland	16,906.39	15.67%	\$11,669,808
NonCrop	4,837.26	4.48%	\$705,233
Residence	3.97	0.00%	\$0
Road	343.95	0.32%	\$0
<b>■02-Crowfoot 158-8</b>	39		
Cropland	10,858.88	10.06%	\$6,451,763
NonCrop	10,366.88	9.61%	\$1,647,974
Oilwell Site	17.07	0.02%	\$2,596
Residence	7.32	0.01%	\$0
Road	250.69	0.23%	\$0
<b>3-Sidonia 158-90 3-Sidonia 158-90</b>			
Cropland	4,662.05	4.32%	\$2,557,570
NonCrop	15,002.39	13.90%	\$2,650,996
Oilwell Site	98.18	0.09%	\$15,830
Residence	5.95	0.01%	\$0
Road	200.89	0.19%	\$0
<b>34-Rat Lake 154-9</b> 3	3		
Commercial	6.04	0.01%	\$0
Cropland	8,380.50	7.77%	\$5,551,158
Gravel Pit	60.42	0.06%	\$0
NonCrop	12,473.27	11.56%	\$1,931,692
Oilwell Site	295.64	0.27%	\$45,240
Residence	11.24	0.01%	\$0
Road	206.27	0.19%	\$0
<b>■48-Mountrail 151-</b>	88		
Cropland	19,619.87	18.18%	\$15,466,023
NonCrop	2,959.16	2.74%	\$527,571
Road	334.56	0.31%	\$0

### Two Years Ago....

### "How do we do this....?"

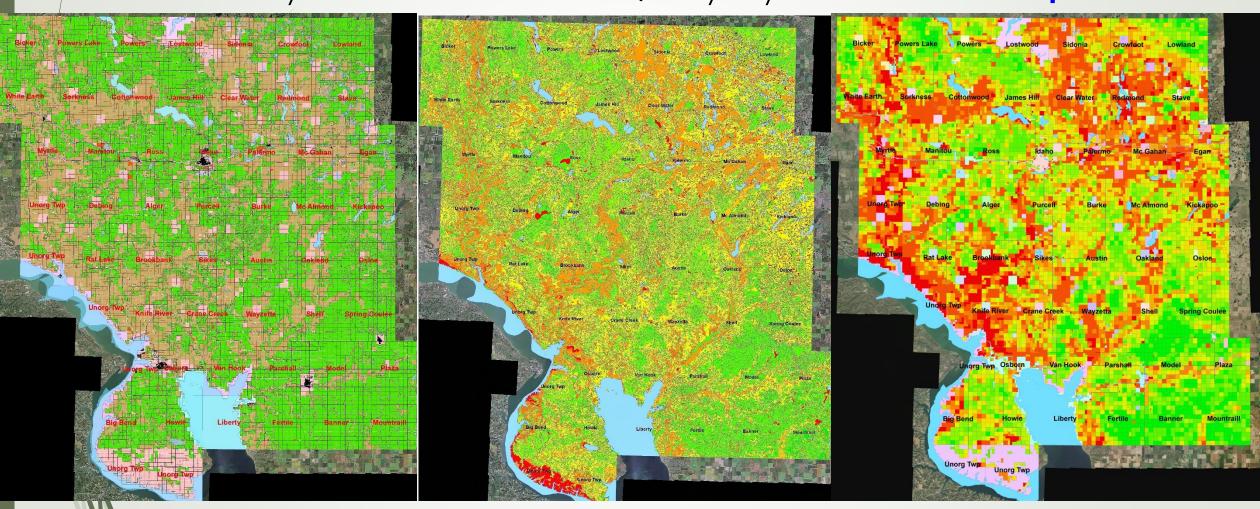


### GIS is the Answer!

Actual Use Layer

NRCS Soils Quality Layer

2019 Average Ag Land Parcel Value per Acre



### **Robust Communication** Campaign

- Ongoing throughout life of project
- Several Soils Committee meetings
  - Collaborative effort for rulesets
  - Additional input and suggestions
  - Attendance at Township Review Meetings
  - Result? "Ownership" of Ag Land Solution
- Articles in the official County paper
- **Presentations at County Commissioner meetings**
- Presentations at Township Officer's meetings
- Presentation to Lion's Club
- Township Review Meetings 55 Townships!
  - Ag Land Valuation overview
  - Reviewed and updated individual's land for Actual Land Use

#### Township Officers Hold Fall Meeting



#### Township Officers Meet

#### OFFICIAL NEWSPAPER OF STANLEY AND MOUNTRAIL COUNTY

#### 2019 Agricultural Land Valuation Information







# Township Review Meetings

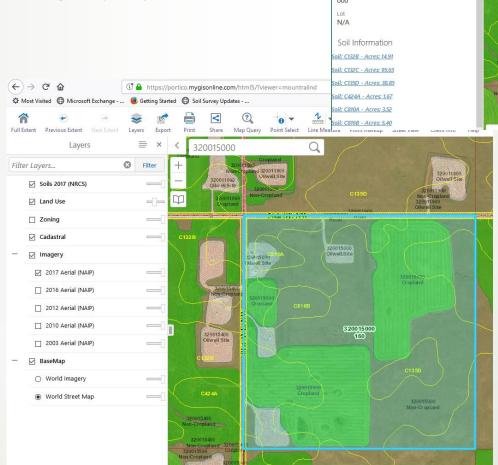
Section by Section Reviews





### GIS – Public Facing

- Various search capabilities
- Several NAIP Years Aerial Photography available
- Actual use Layer
- Soils Layer and information
- Valuation Reporting



320015000

27 154 091

JORGENSEN/ELROY S & EMOJEAN S

(i) A https://portico.mygisonline.com/html5/?viewer=mountrailnd

### **Land Valuation Reporting**

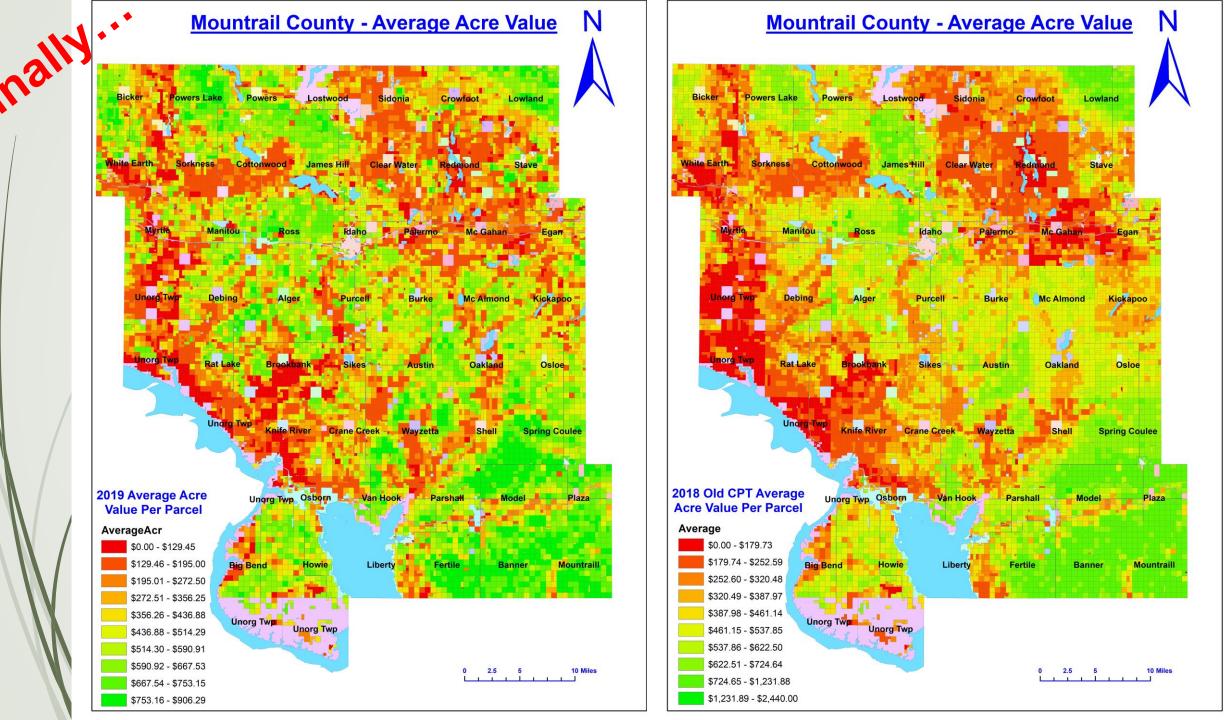
## Sidwell

#### Mountrail

#### **Final Calculation Report**

PARCELS	CRP NUMBER	LAND USE	SOIL	SOIL NAME	NET ACRES	RATE	VALUE
37-0013600							
157.49							
		AG					
			C132C	Williams-Zahl-Zahill	47.75	623	29,768.78
			C135D	Zahl-Williams loams,	29.18	438	12,791.05
			C201A	Bowbells loam, 0 to 3	7.31	974	7,120.74
			C210A	Williams-Bowbells	4.95	886	4,387.88
			C210B	Williams-Bowbells	16.78	847	14,220.55
			C3A	Parnell silty clay loam,	1.42	205	290.48
			C800B C810A	Appam sandy loam, 2 Bowdle loam, 0 to 2	12.29 9.79	390 584	4,788.80 5,721.96
			C816B	Lehr loam, 2 to 6	11.12	448	4,982.76
			COTOD	Leni Ioani, 2 to 6		440	
					140.59		84,073.00
		NCR	C132C	Williams-Zahl-Zahill	1.74	156	270.99
					1.74	152	267.43
			C135D C3A	Zahl-Williams loams, Parnell silty clay loam,	2.50	380	267.43 949.65
			C800B	Appam sandy loam, 2	0.25	156	38.94
			COULD	Appain sarroy loan, 2	6.25	150	
					6.25		1,527.01
		OS	C132C	Williams-Zahl-Zahill	3.34	156	520.17
			C135D	Zahl-Williams loams.	0.13	152	19.75
			C800B	Appam sandy loam, 2	3.27	156	509.27
			COULD	Appain sarroy loan, 2	6.74	150	1,049.19
		55			0.74		1,049.19
		RD	C132C	Williams-Zahl-Zahill	0.96	0	0.00
			C135D	Zahl-Williams loams.	0.66	0	0.00
			C800B	Appam sandy loam, 2	1.45	0	0.00
			C810A	Bowdle loam, 0 to 2	0.40	0	0.00
			C816B	Lehr loam, 2 to 6	0.40	0	0.00
			50105	Com roding 2 to o	3.91	•	0.00
					157.49		86,649.20
					157.49		00,049.20
					157.49		86,649.20





### Questions?







Property Assessor

#### **Mountrail County Tax Equalization**



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