


Introduction



NRCB | Natural Resources Conservation Board




Investigating the Effects Of Manure Management On Groundwater in Alberta

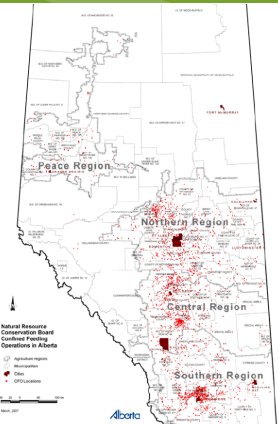
June 29, 2016 San Francisco, CA


Introduction

The Natural Resources Conservation Board (NRCB) is a quasi-judicial agency of the Government of Alberta that reviews proposed natural resource development projects and **regulates confined feeding operations**.


- Agricultural Operation Practices Act (AOPA) amended in 2002
- Risk Management Framework policy
- Little provincial information on potential risk to shallow groundwater resources from manure management activities


Introduction




• CFOs in Alberta

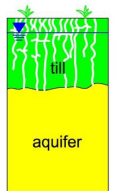
- 3 primary areas
- ~50% national beef cattle herd
- Significant dairy, poultry, and pig populations
- Average number of animals per operation increasing


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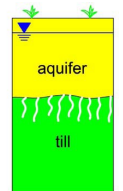
Three main geologic/hydrogeologic conditions affected by manure management activities in Alberta



(a) Thick till



(b) Thin till over bedrock



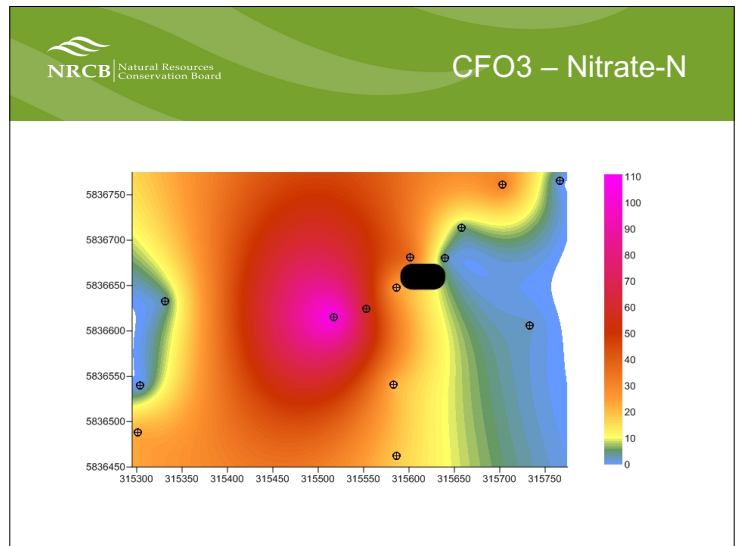
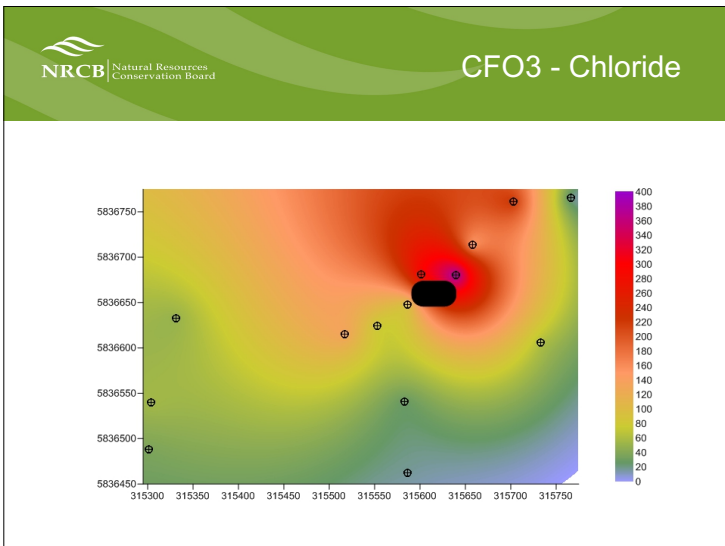
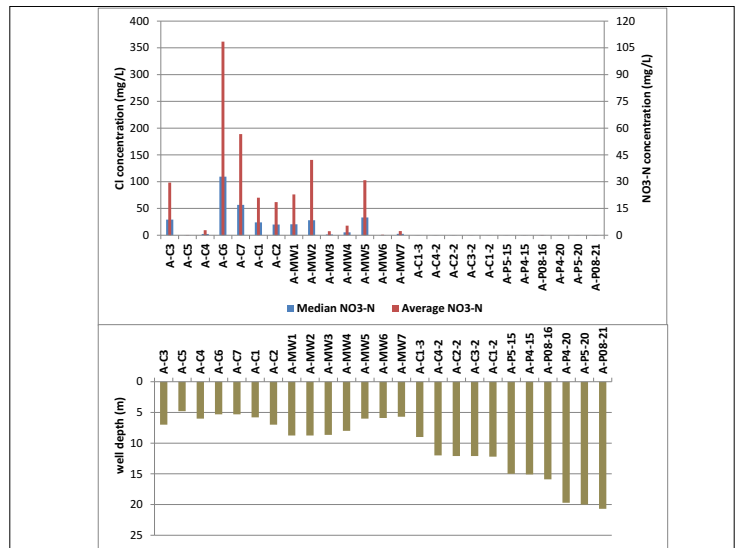
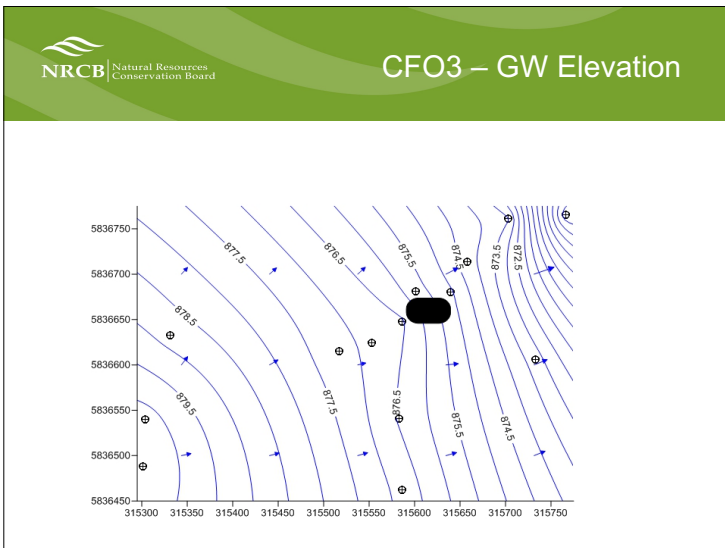
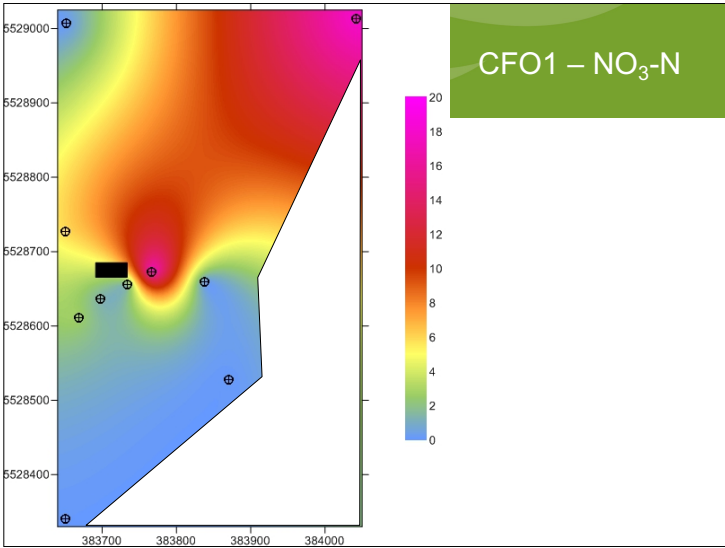
(c) Permeable material

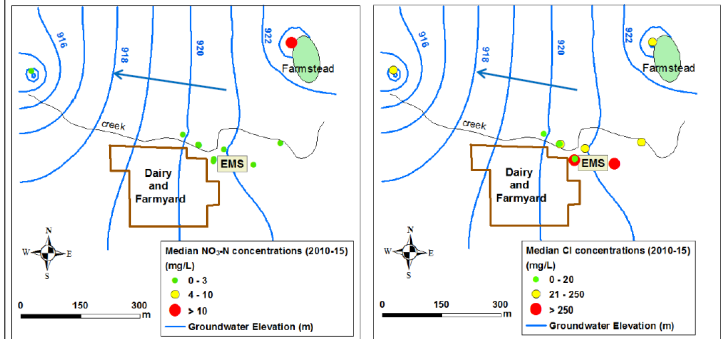

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	CFO1	CFO3	CFO4	CFO5
Geology	sand	thin till	thin till	thick till
Plume				
•Horizontal	~150 m	~100 m	~150 m	< 50 m
•vertical	< 10 m	< 7 m	< 7 m	< 7 m
Denitrification	?	✓	✓	✓
Mixing	✓	✓	✓	?
Other Sources	stockpiling pens	stockpiling spreading sileage(?)	stockpiling spreading pens	septic

- Further analysis of data and relative contributions of sources
- Determine fate and transport mechanisms
- Closure of storage(s) and monitor effects



- Inform policy decisions
- Guide monitoring design
- Improve management



NRCB

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- Andrea Kalischuk
- Barry Olson

Producers



www.nrcb.ca