Cumulative Impacts of Aggregate Development In Trent Lakes Municipality

State of Aggregate Resources in Ontario

Key Concepts

- State of Aggregate Resources Study
- Environmental Assessment & Associated Impacts
- Cumulative Impact Assessment
- Preliminary Mapping
- Future Mapping and Planning

DID YOU KNOW?

1,760 TRUCKLOADS

1 km of 4-lane highway

3,760 TRUCKLOADS

A 32,000m² hospital

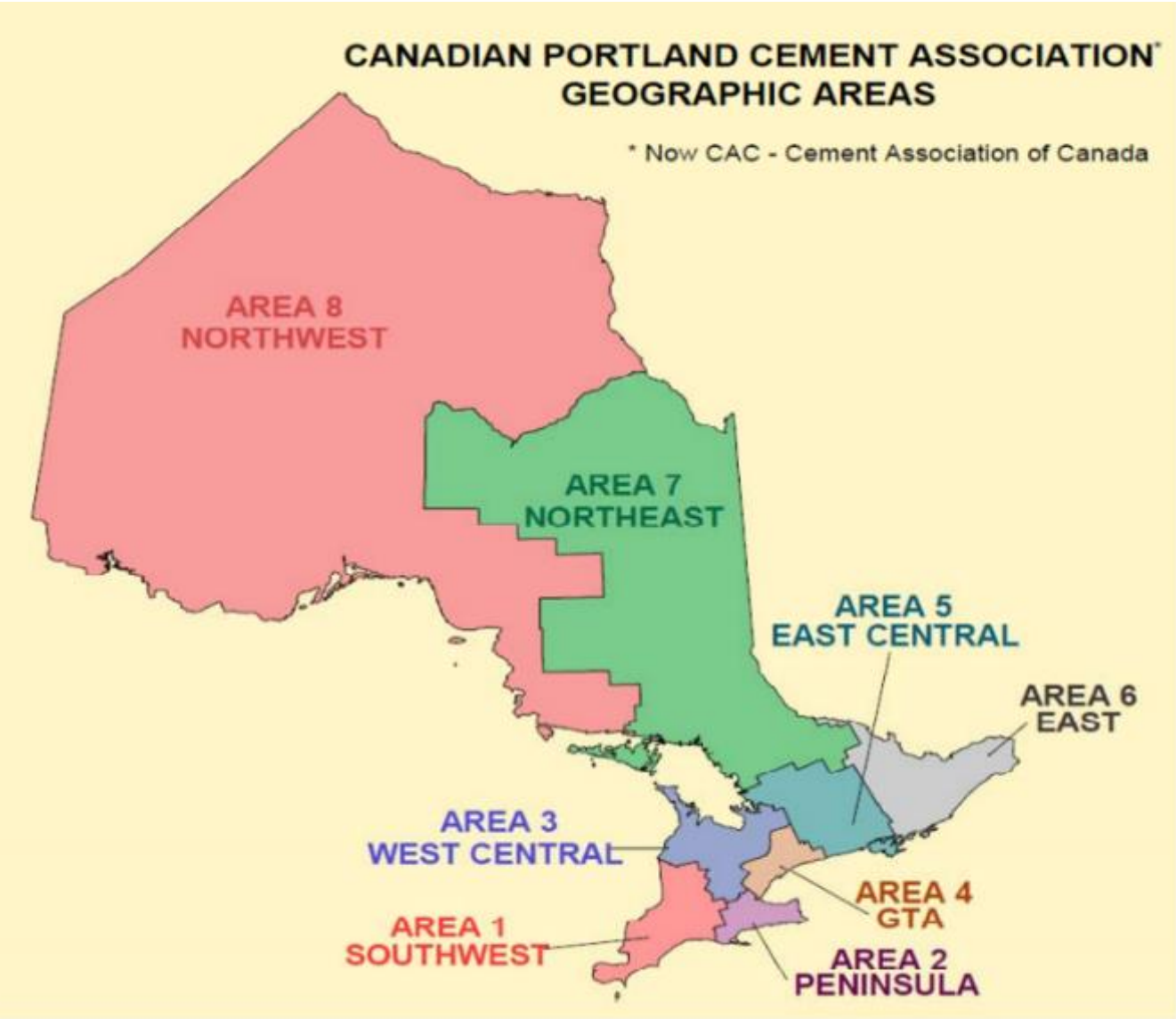
4,560 TRUCKLOADS

1 km of subway line

14 TONNES

Every Ontarian uses
14 TONNES of stone,
sand and gravel each year.

State of Aggregate Resources in Ontario Study (SAROS)



Area 1 Southwest	Area 2 Peninsula	Area 3 West Central	Area 4 GTA
Essex Chatham-Kent Lambton Elgin Middlesex Huron Perth Oxford	Niagara Brant Haldimand- Norfolk Hamilton- Wentworth	Bruce Grey Simcoe Dufferin Wellington Waterloo	Toronto Peel York Durham Halton
Area 5 East Central	**Area 6 East**	**Area 7 Northeast**	**Area 8 Northwest**
Kawartha Lakes Peterborough Haliburton Northumberland Hastings Prince Edward Muskoka	Prescott & Russell Leeds & Grenville Stormont, Dundas, & Glengarry Frontenac Ottawa Lanark Renfrew Lennox & Addington	Nipissing Parry Sound Timiskaming Cochrane Sudbury District Sudbury Region Manitoulin	Algoma Thunder Bay Kenora Rainy River

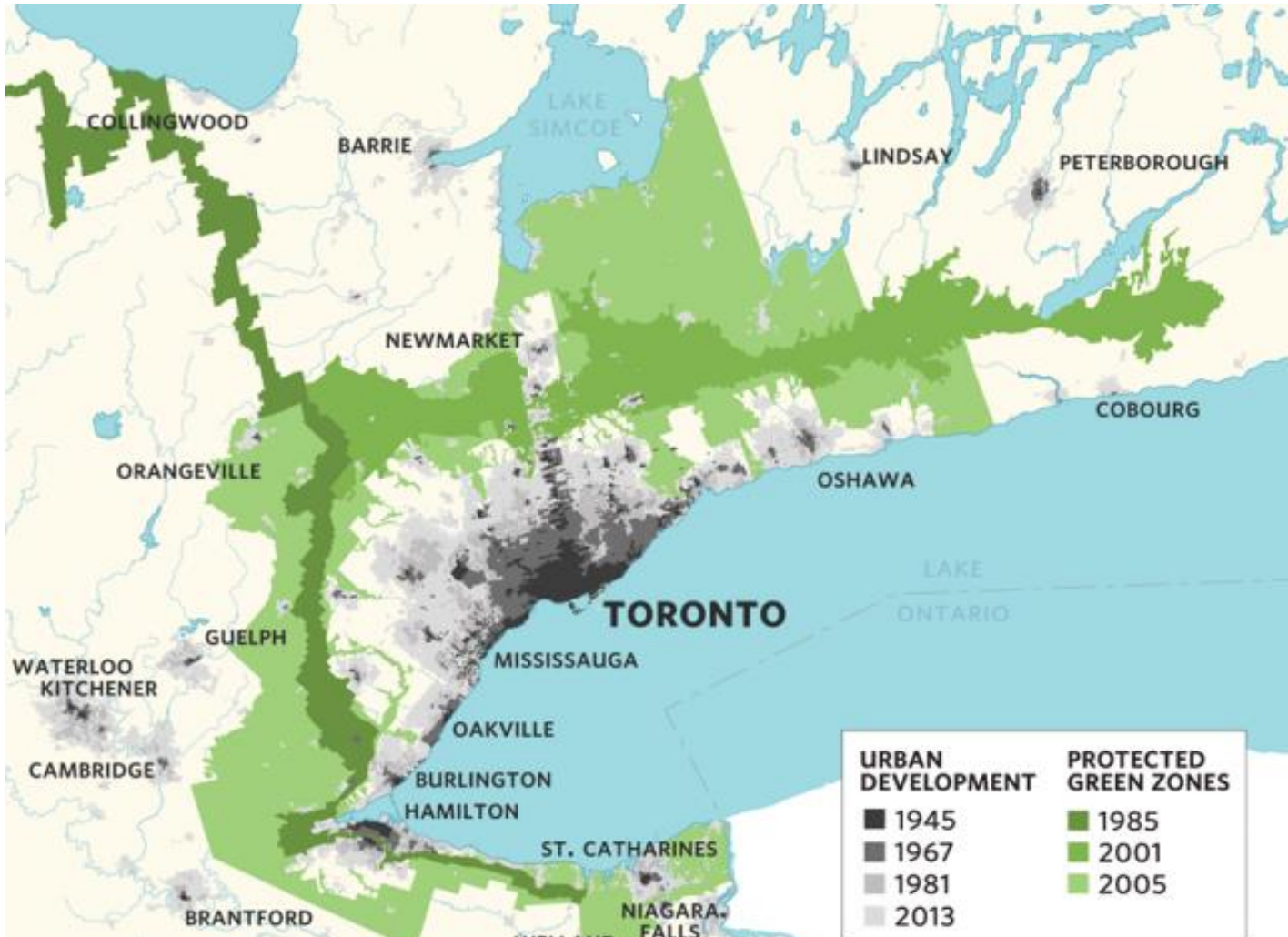
Supply, Demand and Land-Use Conflict

- Past: 3 Billion Tonnes (Last 20 Yrs.)
- Present: 179 Million Tonnes (Annually)
- Future: 1.5 Billion Tonnes (Next 20 Yrs.)

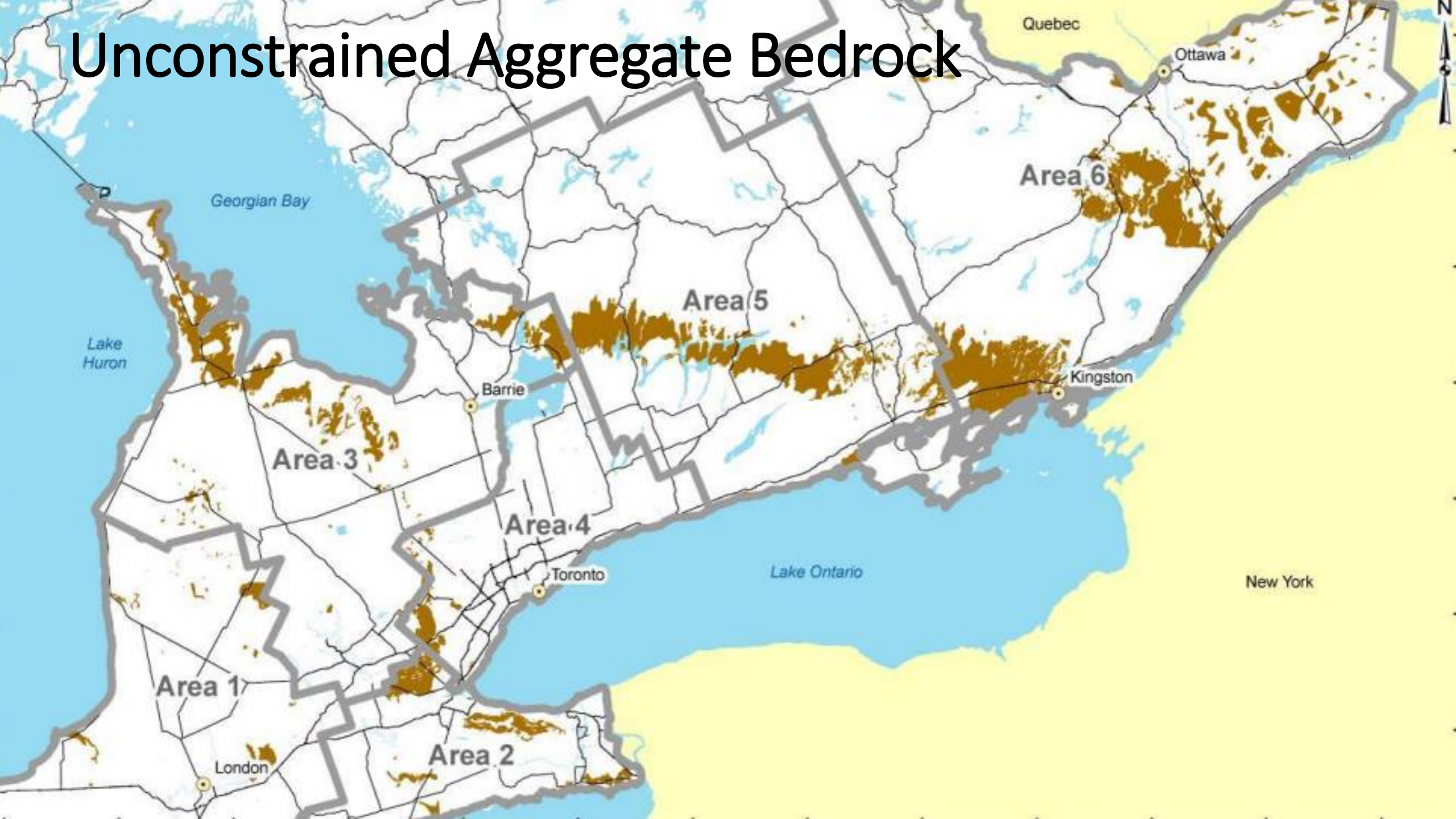
- GTA = 1/3 Total Aggregates Consumed

- Provincial Policy Statement
- Close to Market as Feasibly Possible
- Reduce Greenhouse Gas Emissions

- Encroachment on Greenbelt



Unconstrained Aggregate Bedrock

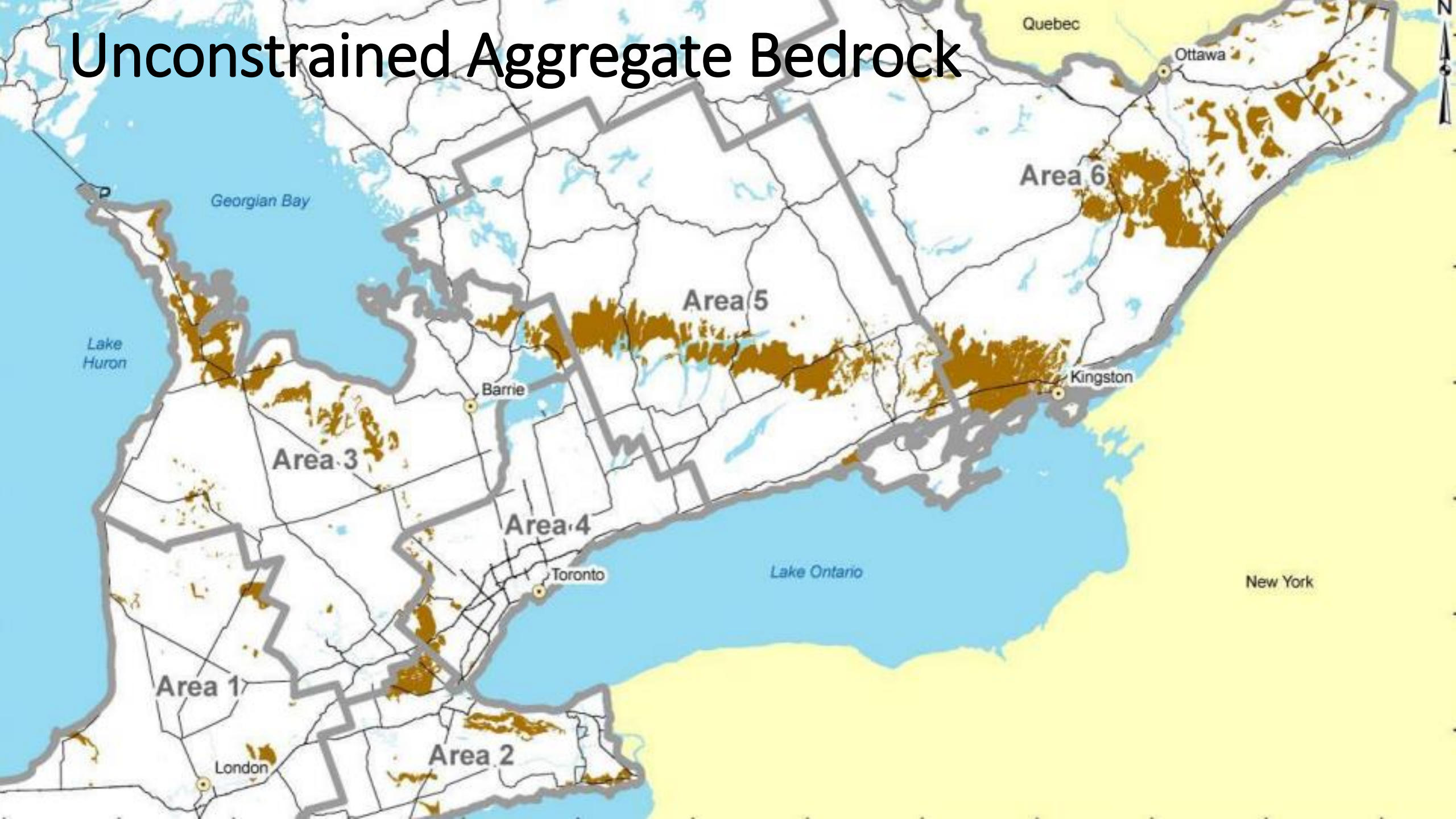


Environmental Constraints/Policy

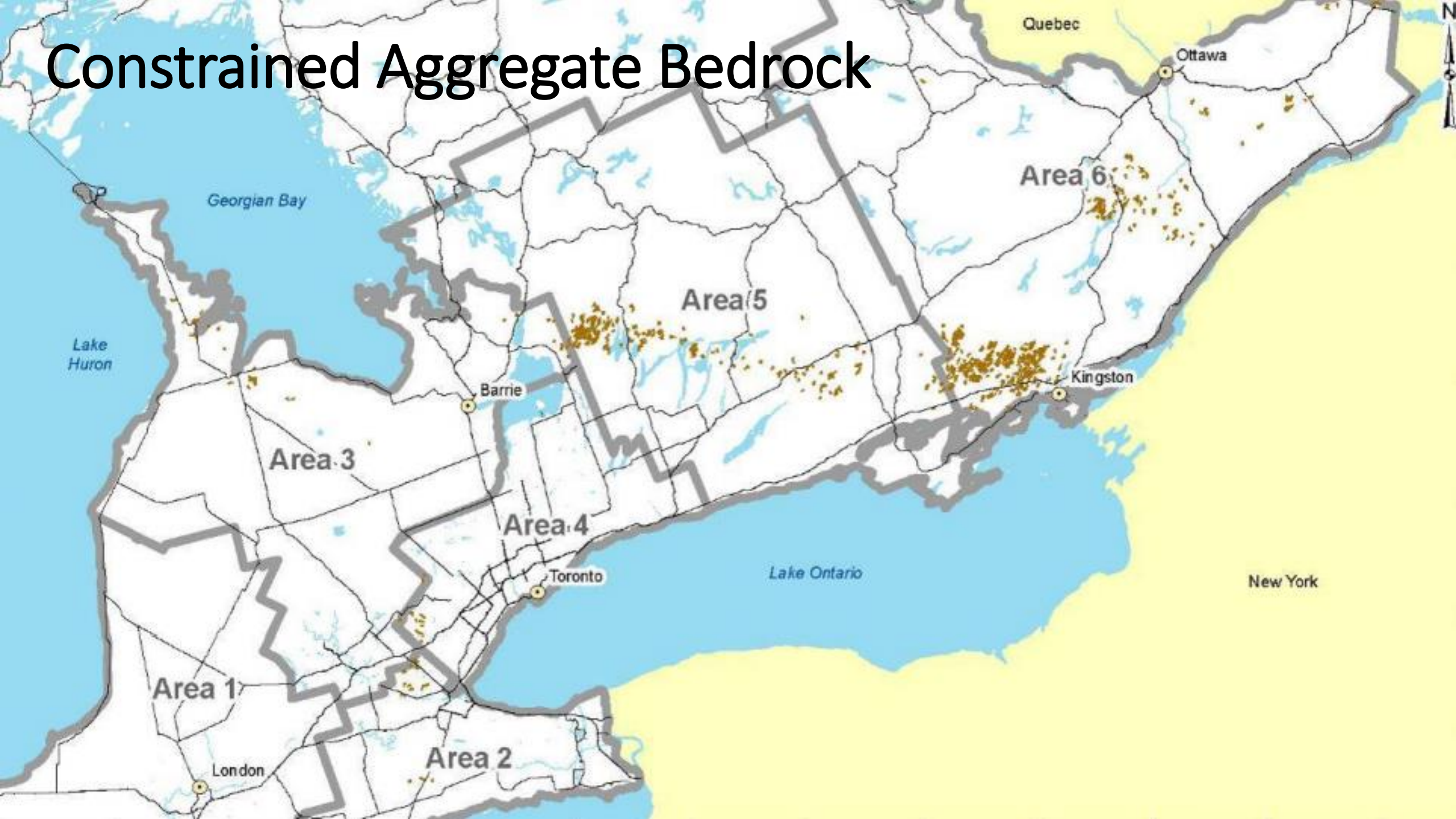
- Estimate Current Location of Aggregate Resources in each Geographic Region
- Examined 20 Parameters
  - 15m - Property Lines
  - 30m - Roadways
  - 30m - Residential Properties
  - 30m – Waterbodies

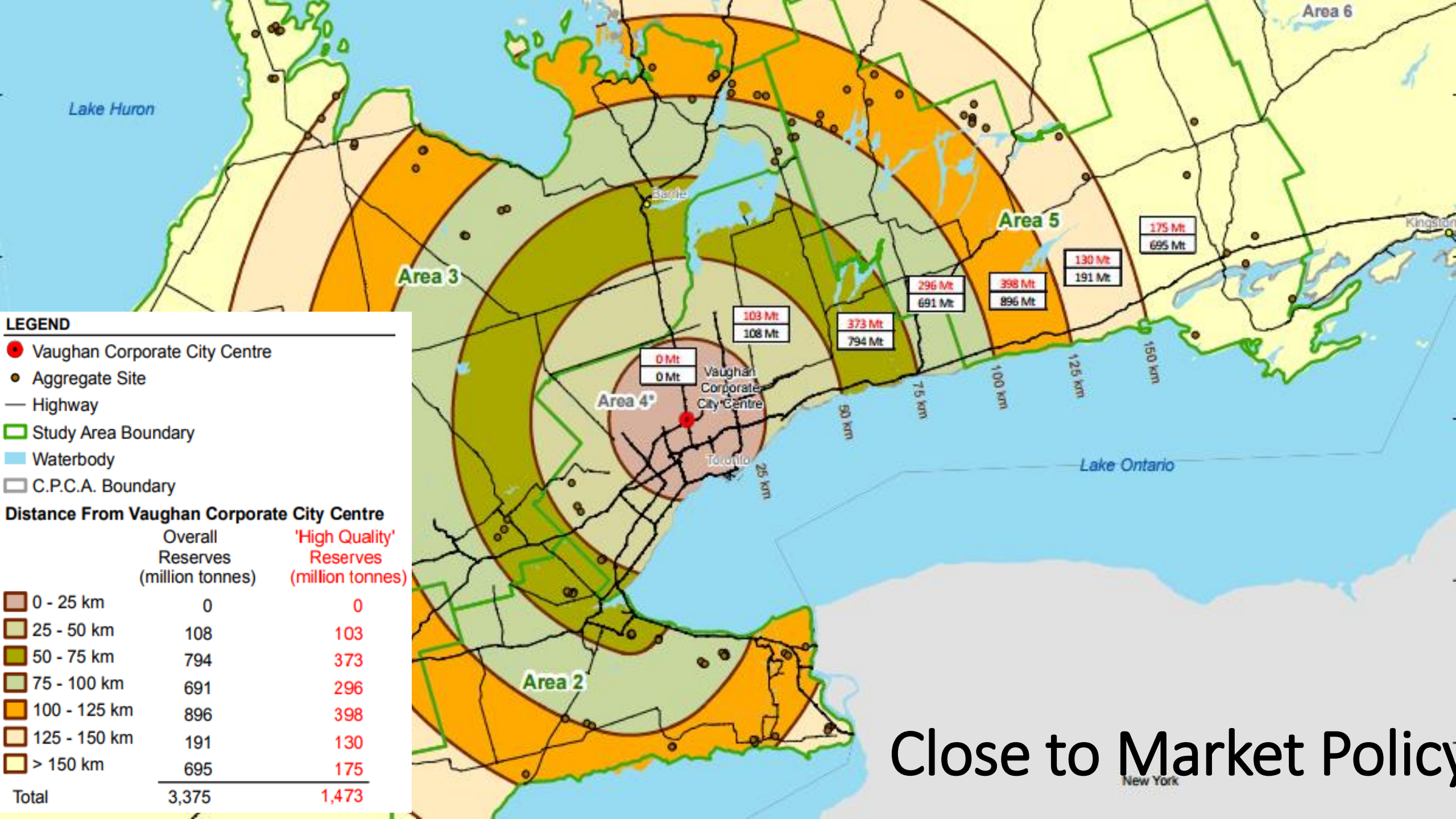
- Did Not Include
- Air, Noise and Blasting Guidelines
- Protection of Residential Wells
- Cultural Heritage Resources
- Resource Quantity/Quality

Unconstrained Aggregate Bedrock



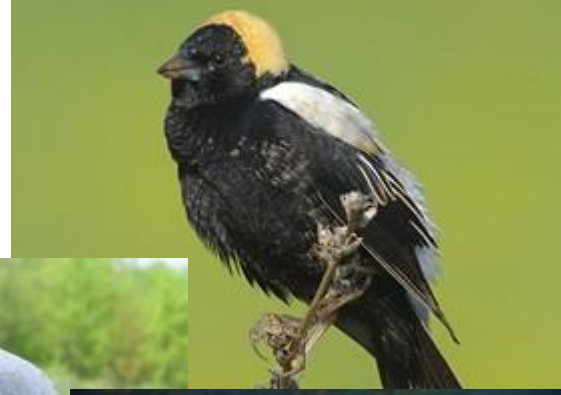
Constrained Aggregate Bedrock





Close to Market Policy

Environmental Impact Assessment



- Project Plan is Presented → Municipal/Provincial
  - 1) consider a reasonable range of alternatives
  - 2) assess the environmental impacts of alternatives
  - 3) demonstrate that the chosen alternative is superior, which must address public input throughout all stages of the process in an open, timely manner, resulting in safer, conscious development
- Comply with Additional Legislation → Fisheries Act, Species at Risk

Environmental Impacts

- Habitat Loss and Fragmentation
- Reduced Biodiversity and Soil Productivity

- Depth/Type of Mining → Entering Below the Water Table
  - Pump and Drain water
  - Alter Hydraulic Properties, Substrate, Turbidity, Conductivity

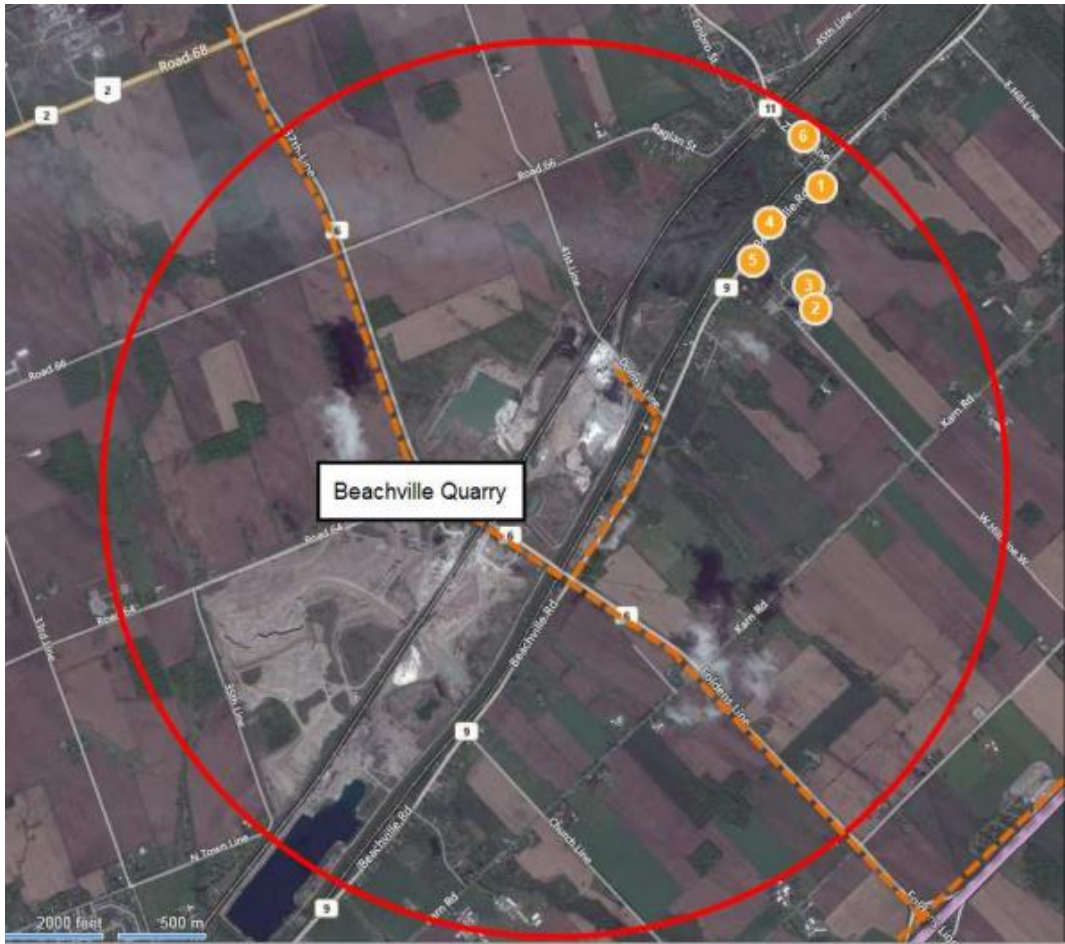
- Dust → Crushing, Blasting, Processing
  - 30-min and 24-h maximum (TSP conc. of 100 and 120 µg/ m^3)

- Noise
  - Class A, B, C (Urban-Rural)
  - 45 dBA → Ambient Noise (Bird Calls, Conservation at Home)
  - 120-128 dBL → Blasting (Thunder-Military Jet Take-off)

Socio-Economic – Landsink Consulting

- Direct De-valuation of Land
  - General Public Apprehension Living Close to Quarry

- Examined Diminution in House Price
  - 19 Homes
  - Price Purchase/After
  - Average -23.19%
  - Min -8.57%
  - Max -39.36%
- House $175,000 (‘04) → $237,825 (‘12)
- Resold →$145,000 (-92,823/-39%)



Cumulative Impact Assessment Vs. EIA

- Assess Long-term Impact of a Proposed Project
  - Confliction/Alignment of Broader Social/Environmental Values
  - Successive Actions of the Past, Present, Future

1. Consultation
   - Valued Ecosystem Components

2. Causes Effect-Relationships
   - Multiple Effects
   - Broader Geographical
   - Suspected Effects→ Based on Identified Thresholds

3. Evaluate Significance of Effects
   - Thresholds
   - Social Context
   - Land use Objectives

4. Implement Monitoring and Management → Below Thresholds

Cumulative Impact Assessment Framework

1. Identify residual impacts for project under review

- Class A Quarry >20,000 Tonnes Annually

2. Identify other projects that might interact with the project under review

- Multiple Aggregate, Forestry, Agriculte, residential

3. Determine geographic scope

- Local, Municipal, Regional

4. Determine temporal scope of Impacts

- Based on Resource Size (5-35 yrs)

Continued

5. Analyse the scale of cumulative impacts to determine need for mitigation

- Positive, Negative, Neutral → Magnitude + Frequency
- Is it Reversible

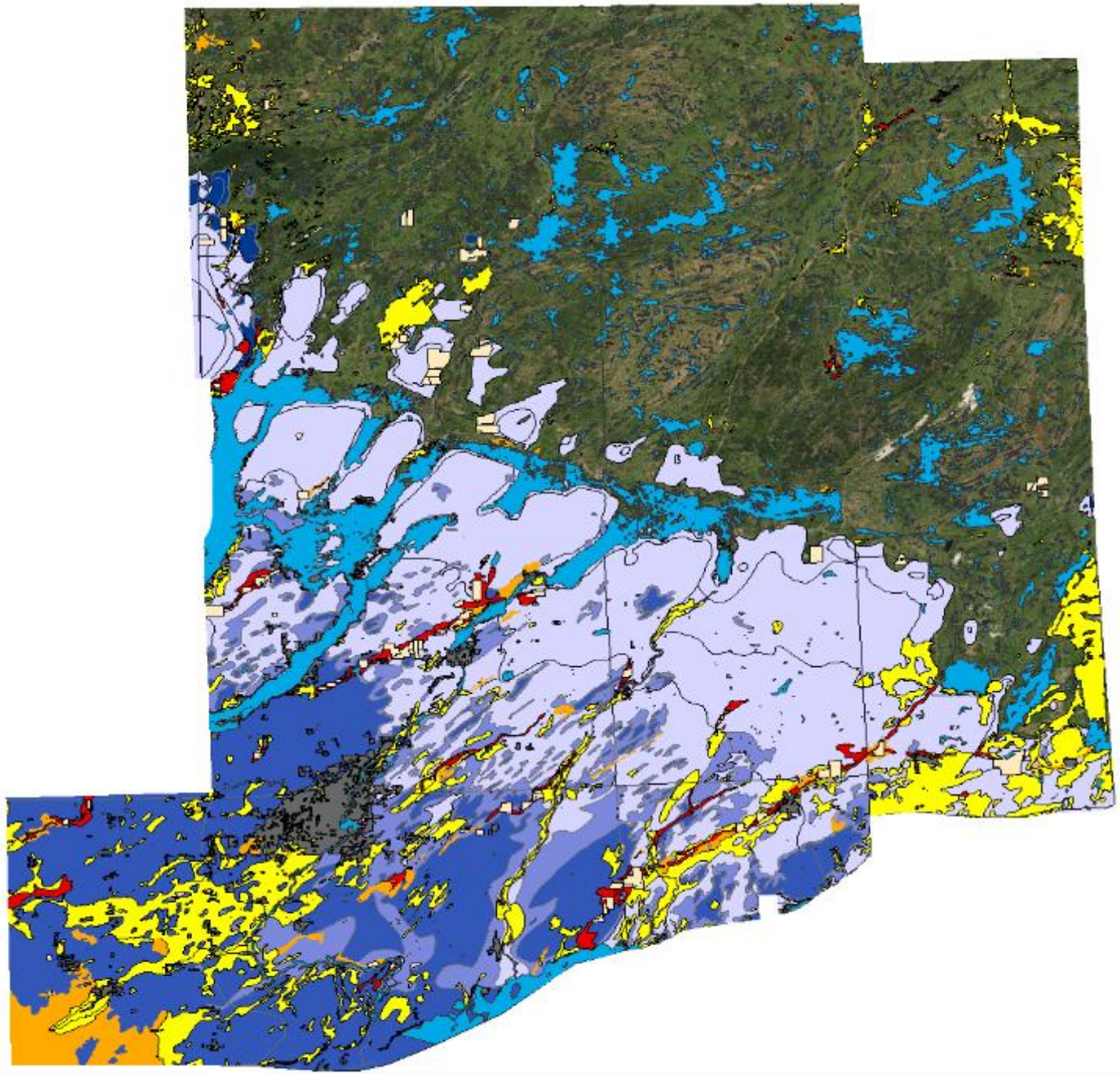
➢Fragmentation, Erosion, Fugitive Dust Emission

6. Identify mitigation measures to offset cumulative effects

➢Maintain Corridor, Reroute Road/Geotextile Material, Dust Suppressants

7. Determine significance of cumulative effects

➢Statistical, Scientific/Professional Judgment, Level of Public Concern



Peterborough County

Sand, Stone, and Gravel Reserves

N

Legend

- Minor Waterbodies
- Major Waterbodies
- Buil-Up Areas
- Aggregate Sites

Sand and Gravel

Class

- Primary
- Secondary
- Tertiary
- Restricted Resource

Bedrock

Countour Lines

- 1 m to 8 m
- 8 m to 15 m
- Greater than 15 m
- Less than 1 m

6 3 0 6 12 18 Kilometers

1:280,000

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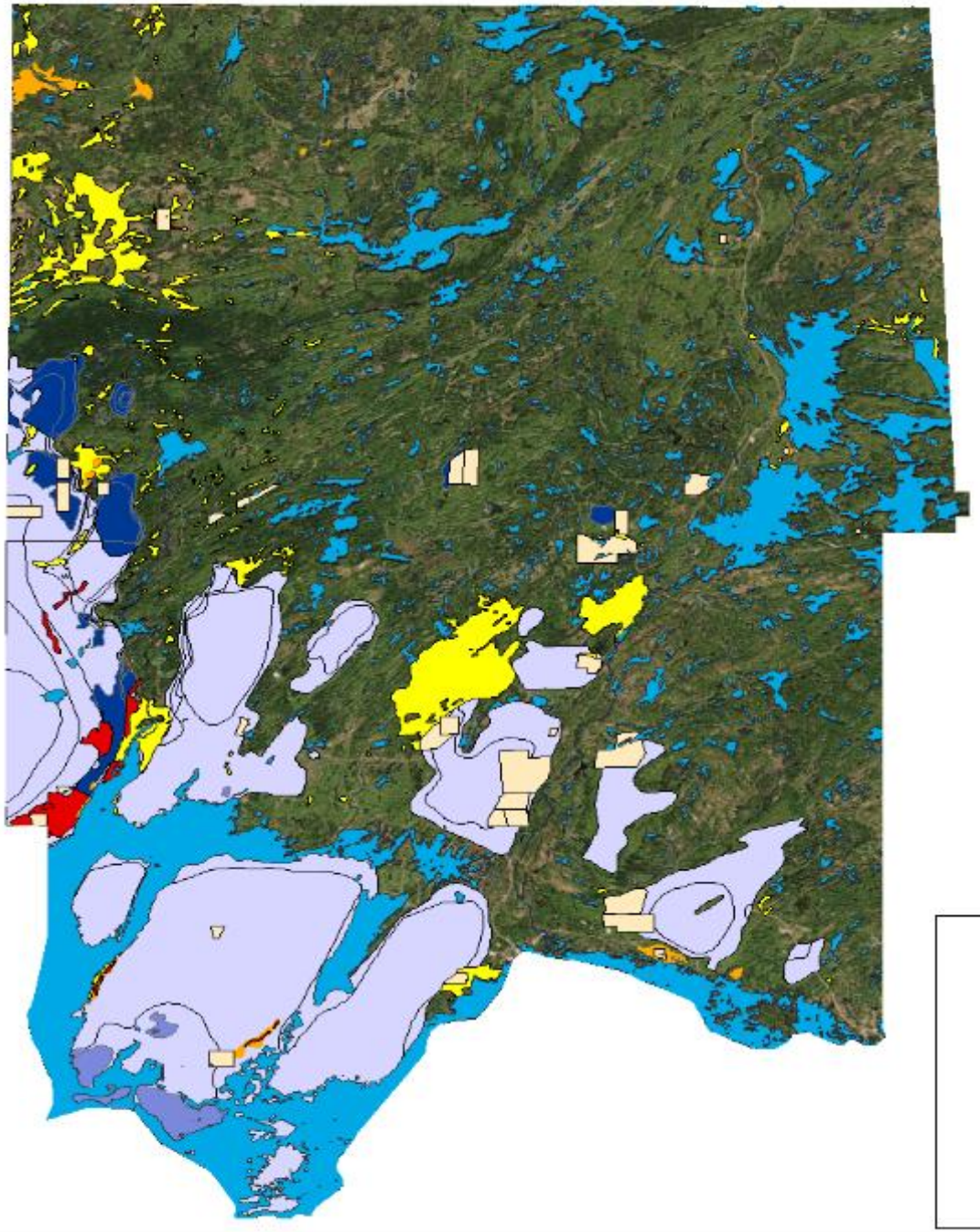
Created by: Spencer Gilbert-Parkes
Trent University, March, 2017

Trent Lakes Municipality

Cumulative Impact Assessment
Aggregate Development- Overview



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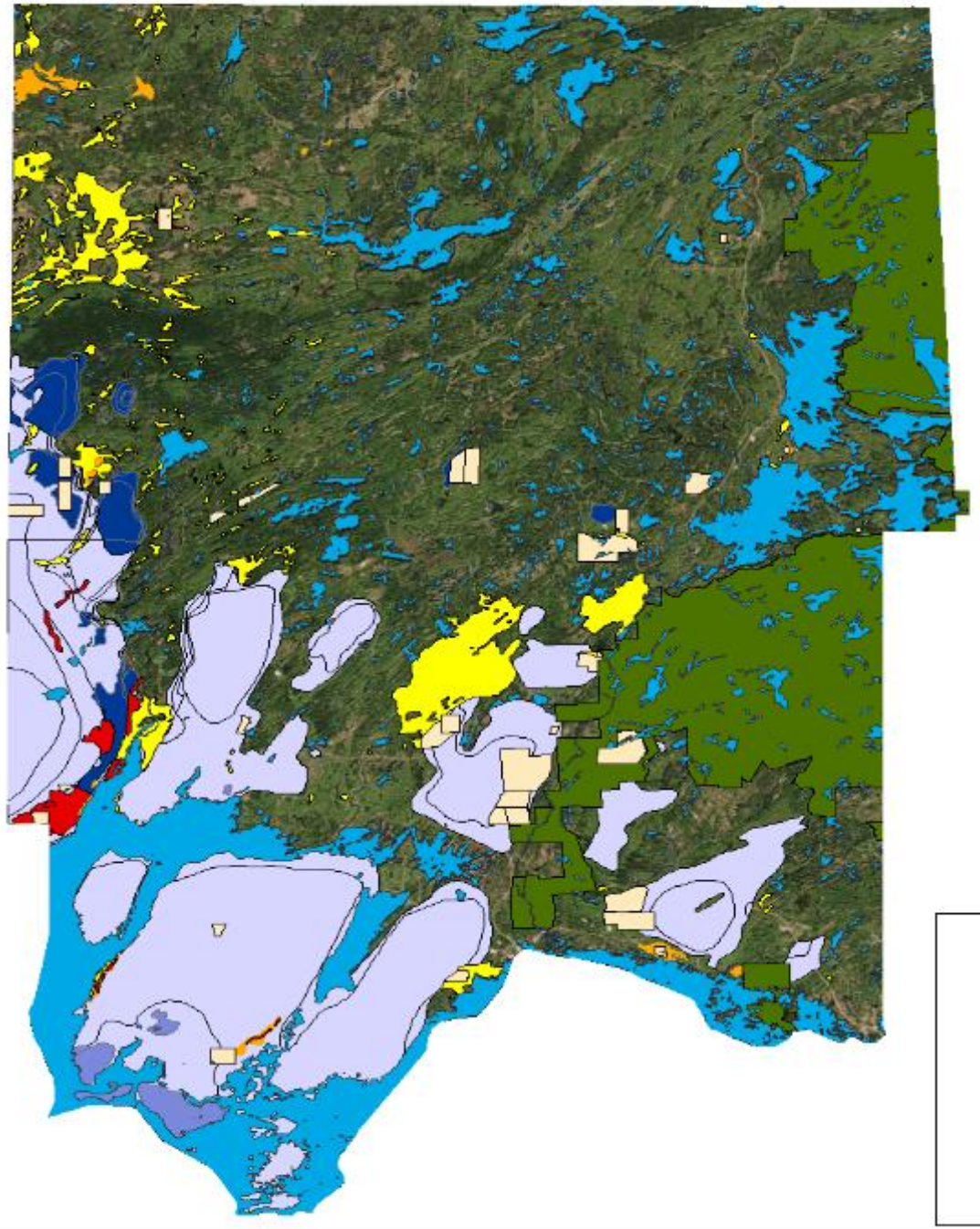

Trent Lakes Municipality

Cumulative Impact Assessment
Aggregate Development- Overview

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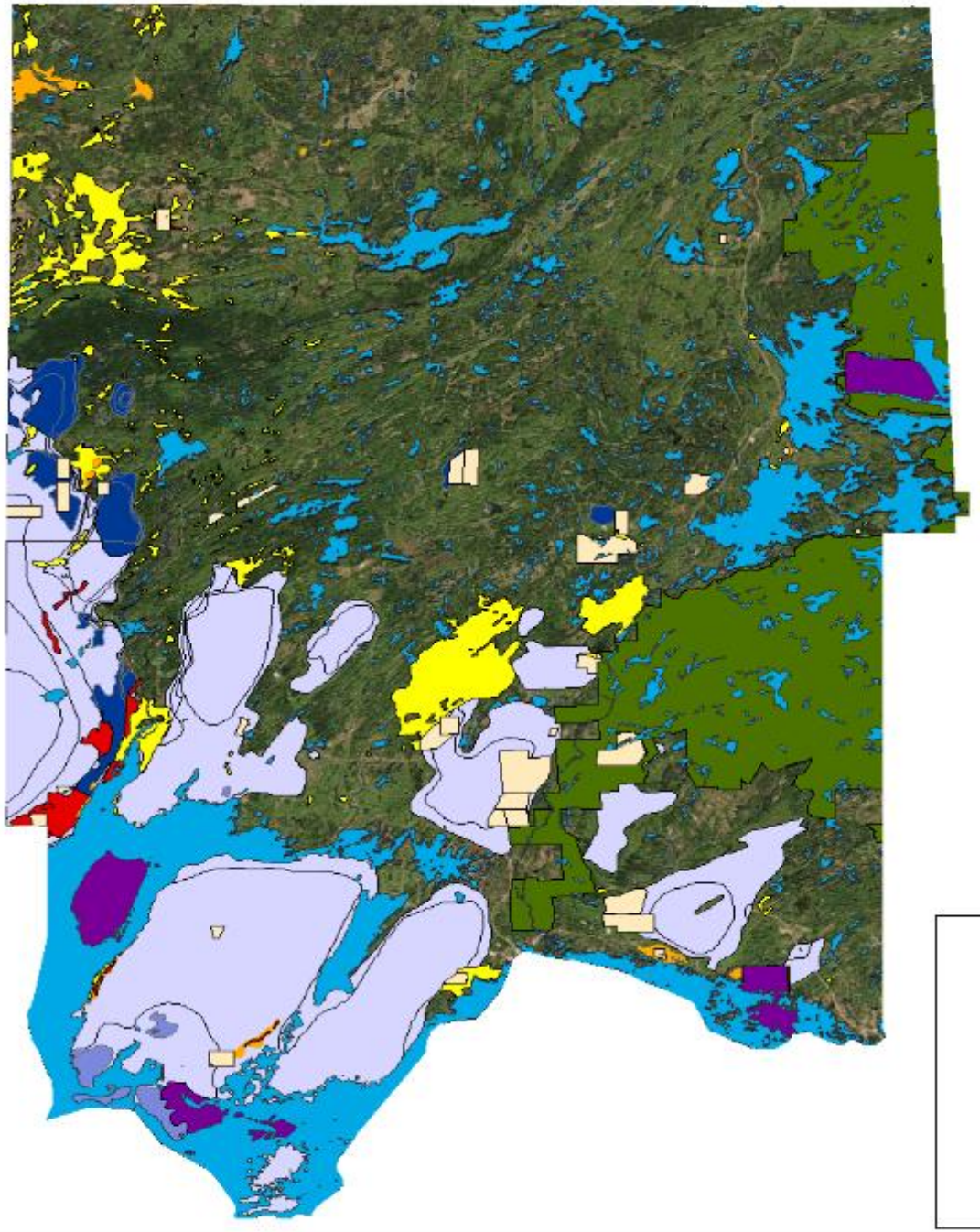

Legend

- Minor Waterbodies
- Major Waterbodies
- ANSI, Earth Science
- ANSI, Life Science
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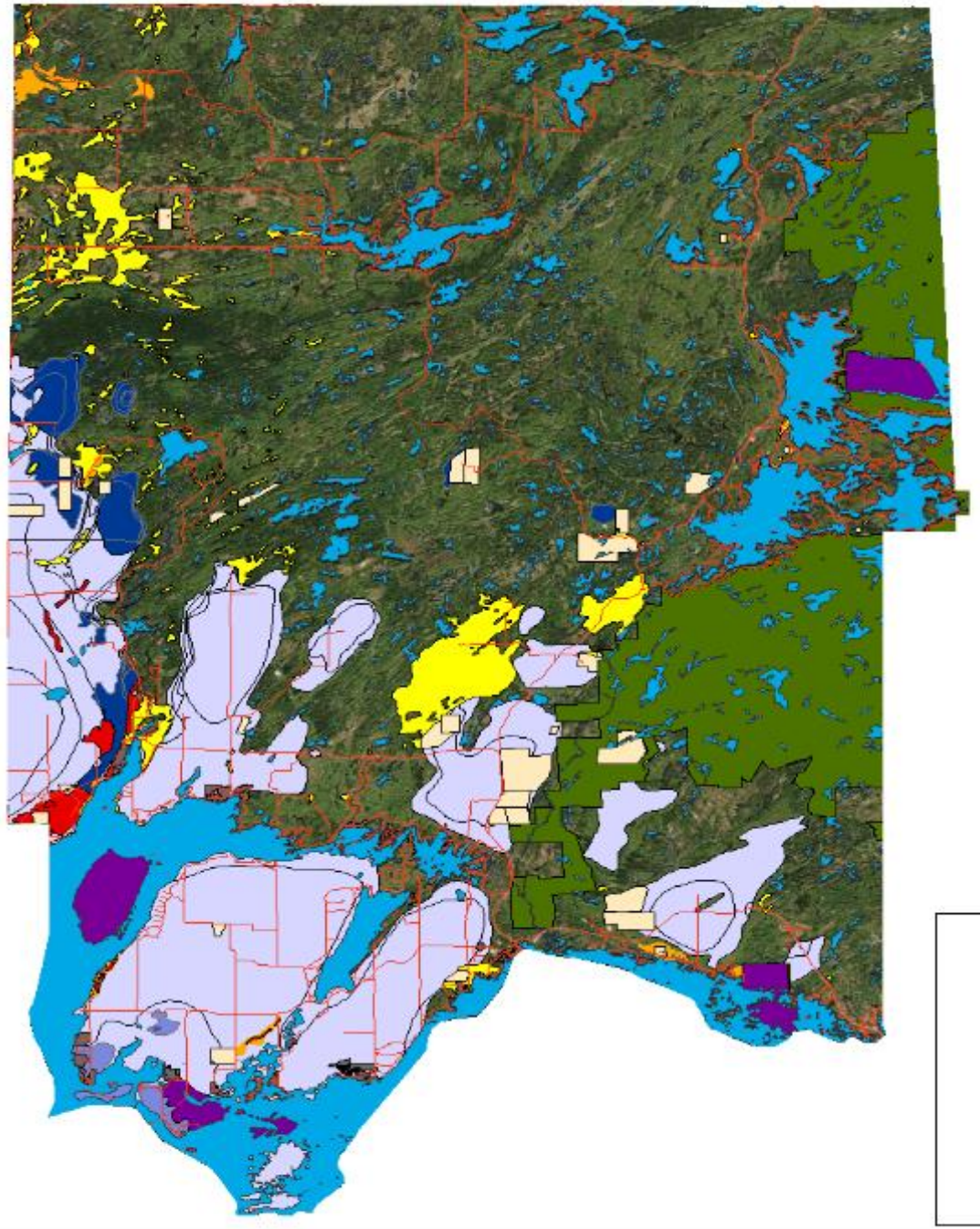

Legend

- Roads
- Minor Waterbodies
- Major Waterbodies
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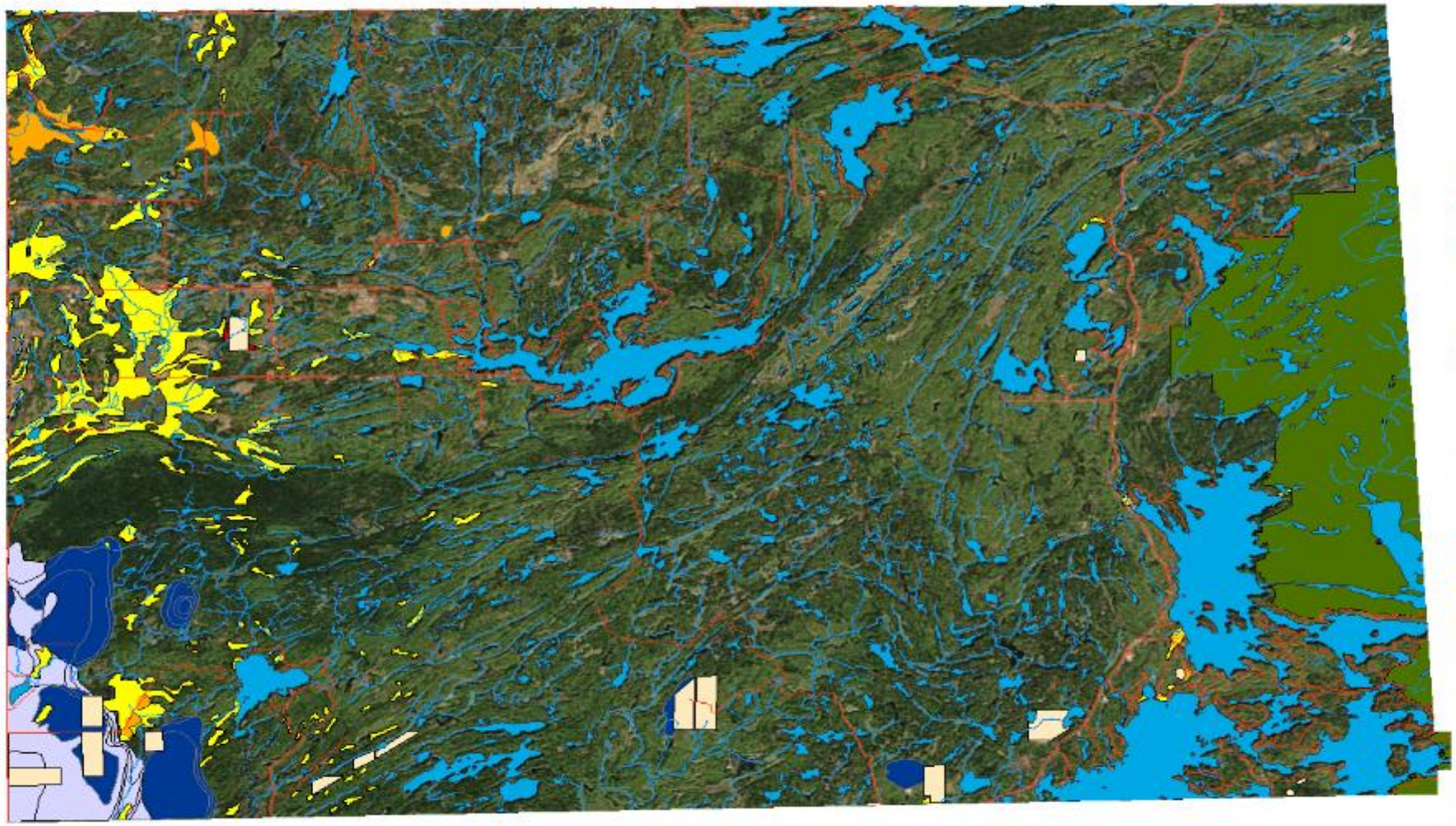
Trent Lakes Municipality

Cumulative Impact Assessment
Aggregate Development-North



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Bedrock

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- Roads
- Watercourse

1.5 0.75 0 1.5 3 4.5 Kilometers

1:90,000

Municipality of Trent Lakes

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Trent Lakes Municipality

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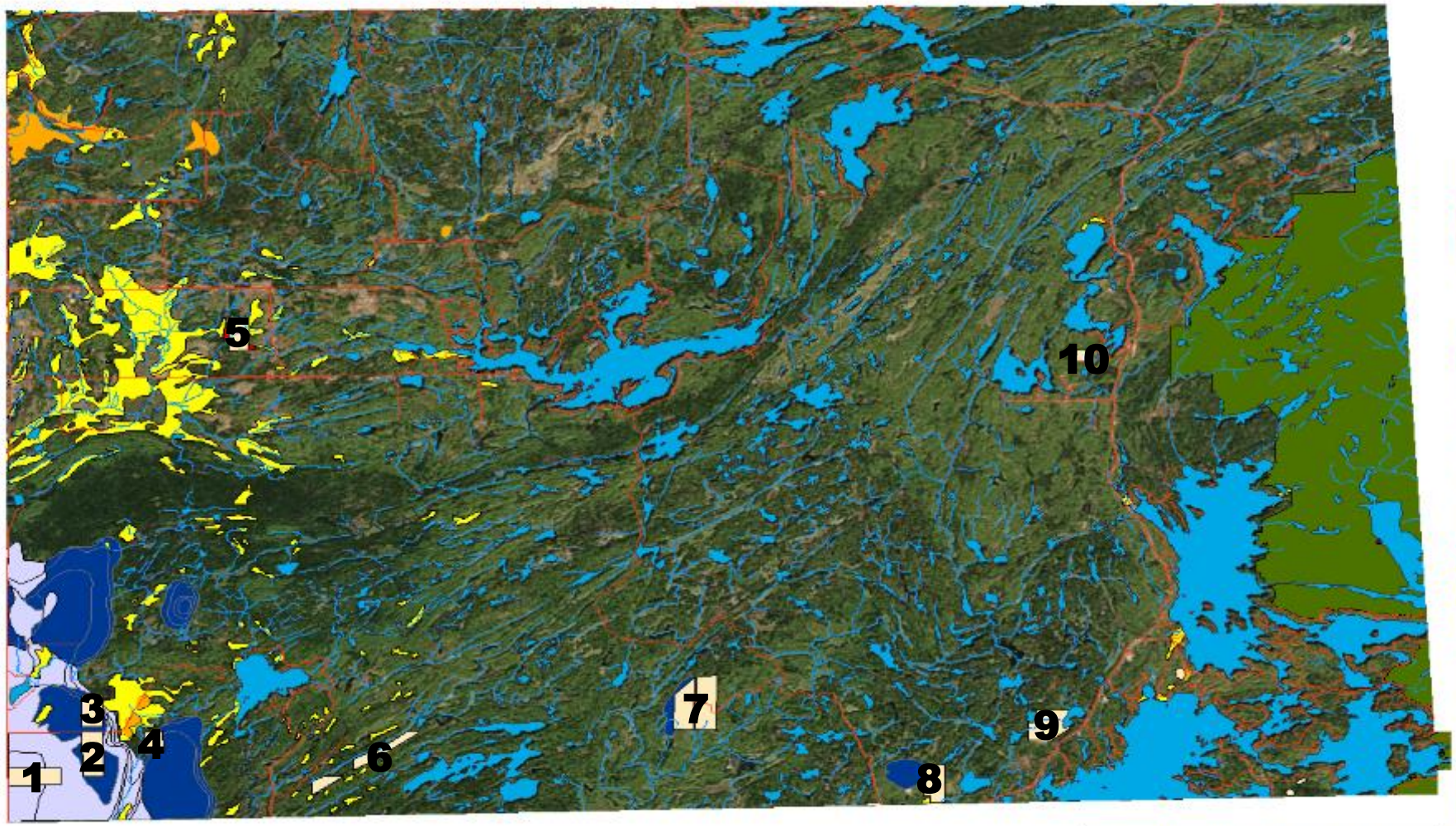
Aggregate Development-North



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Municipality of Trent Lakes

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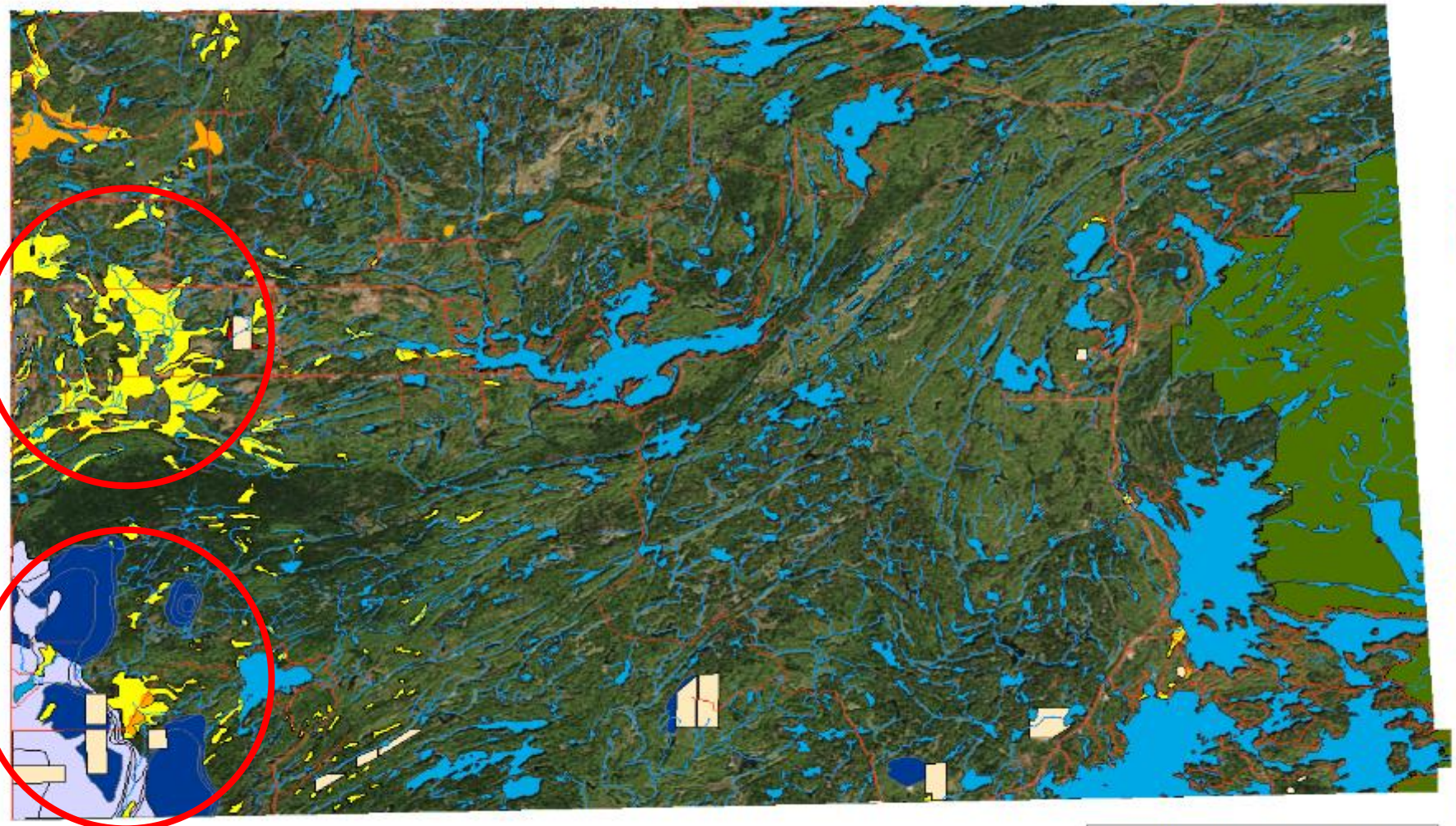
Operating Aggregate Sites

Client Name	Class	Type	Status	Location	Area (ha)	Max Tonnage Limit
Redstone Quarries	A	Q	Active	Bobcaygeon	40.5	850,000
Young's Aggregates Inc.	B	Q	Active	South Property	38.25	20,000
Mervin Johnston	N/A	Q	Active	Silver Lake Quarry	29.75	N/A
Buckhorn Sand and Gravel	N/A	Q	Surrendered	Bass Lane Quarry	14.1	N/A
Earth Resources Ltd.	B	P	Active	South Vermiculite Site	11.7	20,000
Jeff Parnell Contracting Ltd.	A	Q	Active	Galway Original & Extension East	125.32	1,000,000
Aecon Construction	A	Q	Active	Mountain Lake Quarry	164.11	250,000
Regis Resources Inc.	N/A	Q	Active	Regis Site	51.57	N/A
Dudman Construction Ltd.	B	P	Active	Franzen-Galway Pit	30	20,000
Ira Robertson	B	P	Active	N/A	1.1	20,000
				Total	**506.4**	**2,180,000**



Trent Lakes Municipality

Cumulative Impact Assessment
Aggregate Development-North

N

Legend

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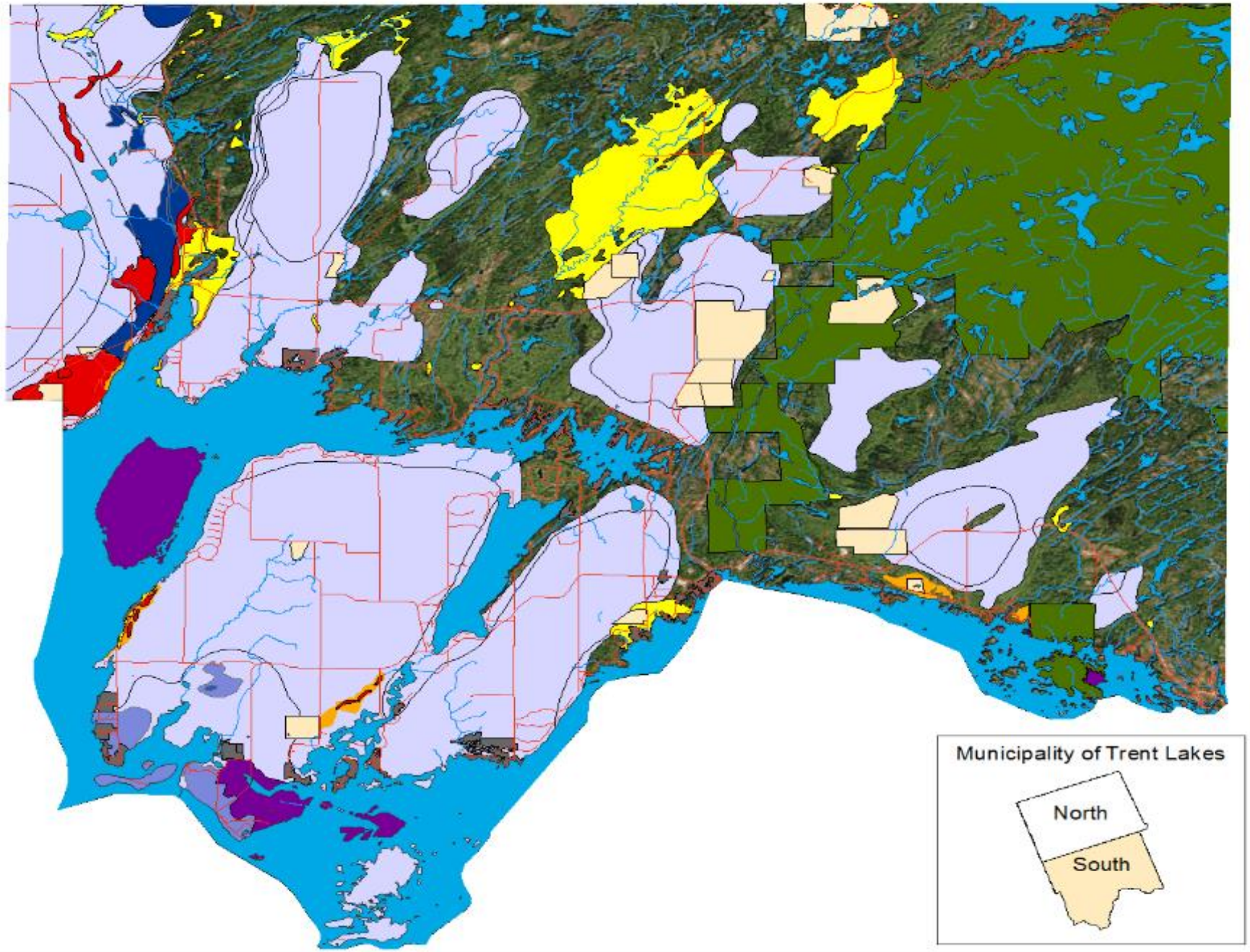

Trent Lakes Municipality

Cumulative Impact Assessment
Aggregate Development-South

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1.50.75 0 1.5 3 4.5 Kilometers

1:85,000

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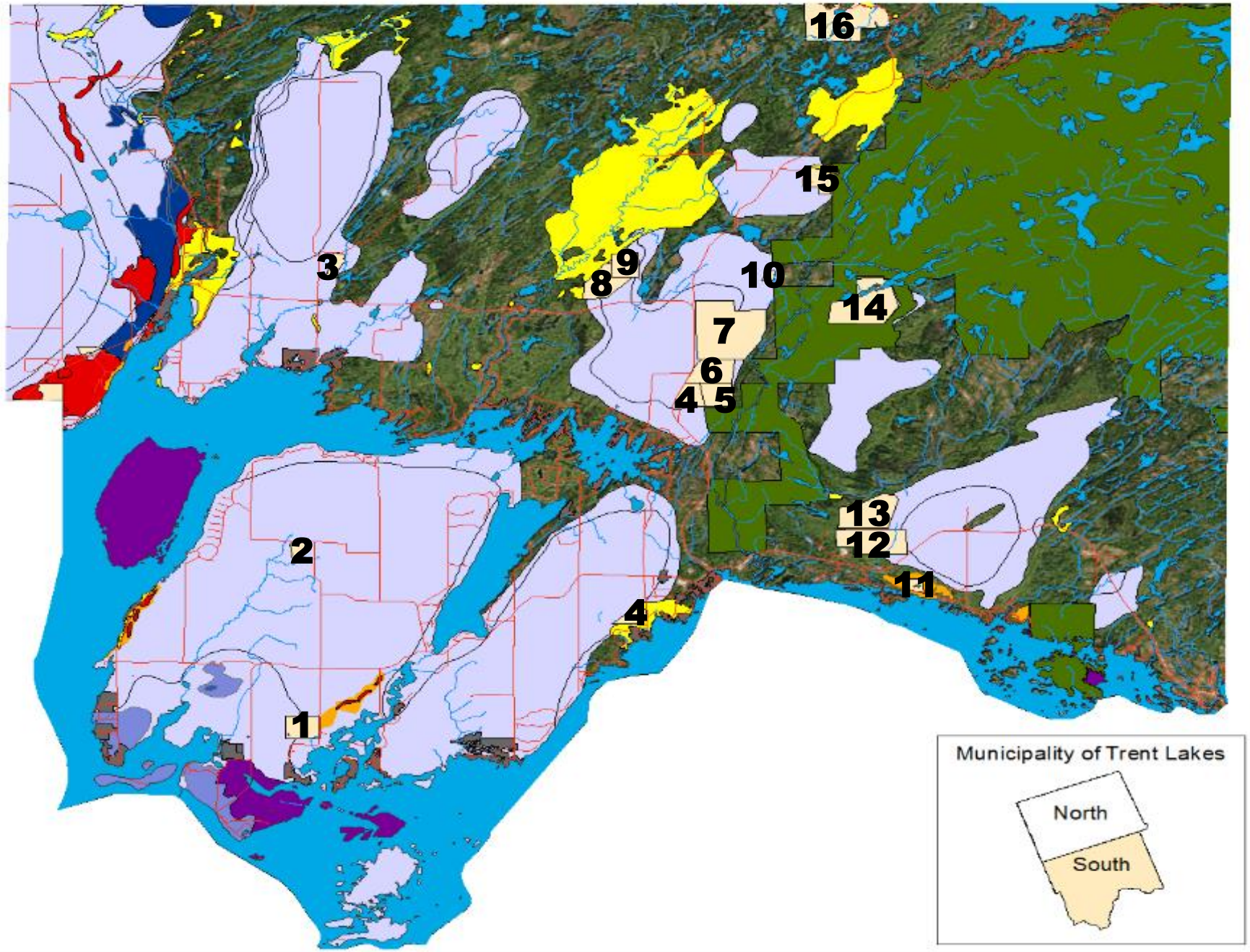

Trent Lakes Municipality

Cumulative Impact Assessment
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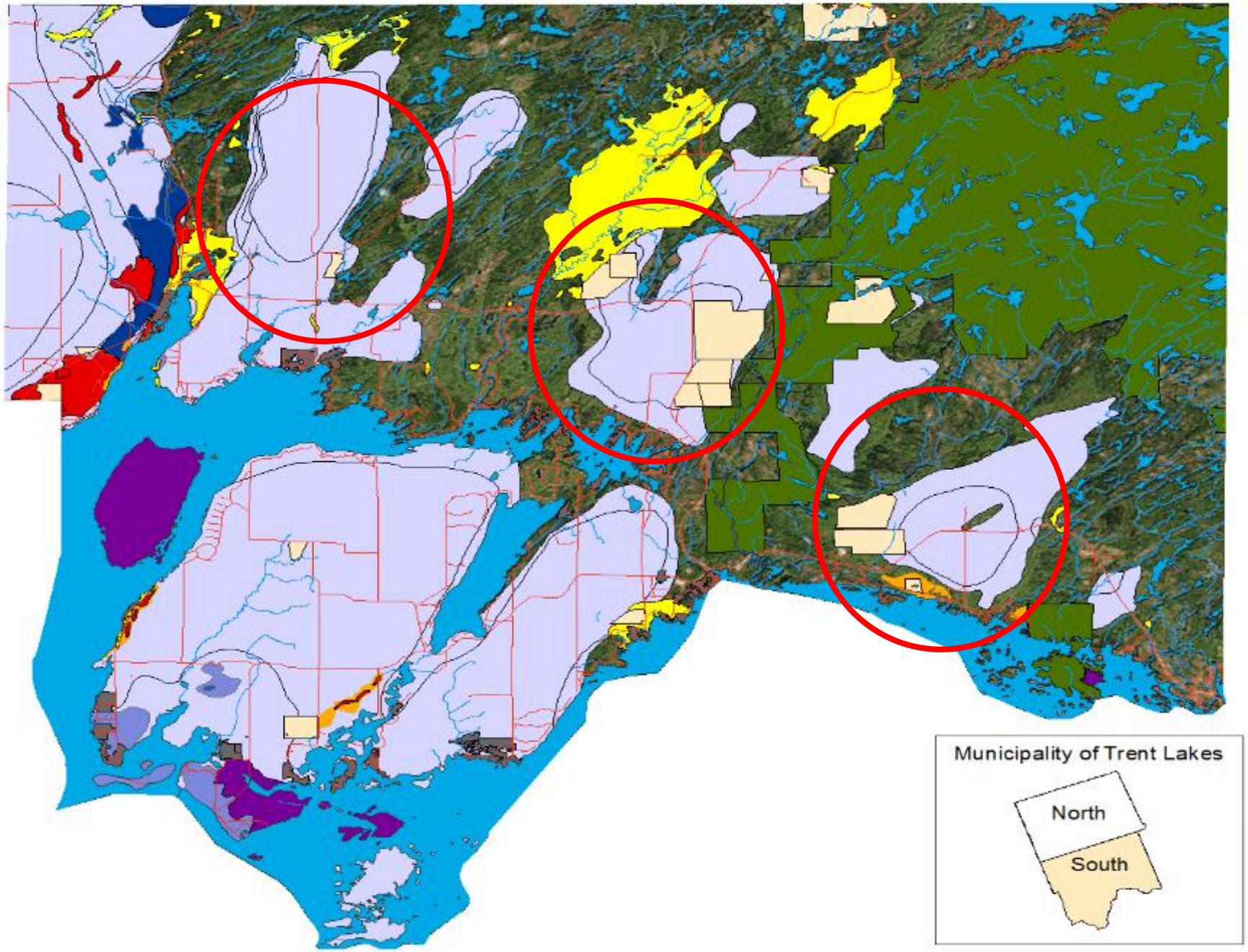
Operating Aggregate Sites

Client Name	Class	Type	Status	Location	Area (ha)	Max Tonnage Limit
Corporation of the Township of Harvey	B	P	Active	N/A	41.44	20,000
Ronal Windover	B	P	Active	N/A	13.08	20,000
Corporation of the Township of Harvey	A	P	Active	N/A	14	100,000
John William	B	P	Active	N/A	5.46	20,000
The Emerald Group	B	Q	Active	Johnson Quarry	12.33	20,000
Larfarge Canada Inc.	A	Q	Active	Buckhorn Quarry	83	500,000
Ronal Windover	B	P	Active	N/A	9.5	20,000
John Halminen	A	Q	Active	Buckhorn Quarry	83.3	250,000
Dufferin Aggregates	A	Q	Active	N/A	48.78	1,000,000
Ormell Sand and Gravel Limited	A	Q	Active	N/A	27	400,000
Dufferin Aggregates	A	Q	Active	N/A	57.6	1,000,000
Stonscape Ontario Inc.	A	Q	Active	Flynn's Corner's Property	173.83	1,500,000
Pluard & Sons Quarry Ltd.	B	Q	Active	Pluard Property	55.3	20,000
Pluard & Sons Quarry Ltd.	A	Q	Active	North Extension Property	30.78	20,000
Kawarth Rock Quarry Inc.	A	Q &P	Active	N/A	32.78	182,000
Aecon Construction	A	Q	Active	Mountain Lake Quarry	164.11	250,000
				Total	852.29	5,322,000



Trent Lakes Municipality

Cumulative Impact Assessment
Aggregate Development-South

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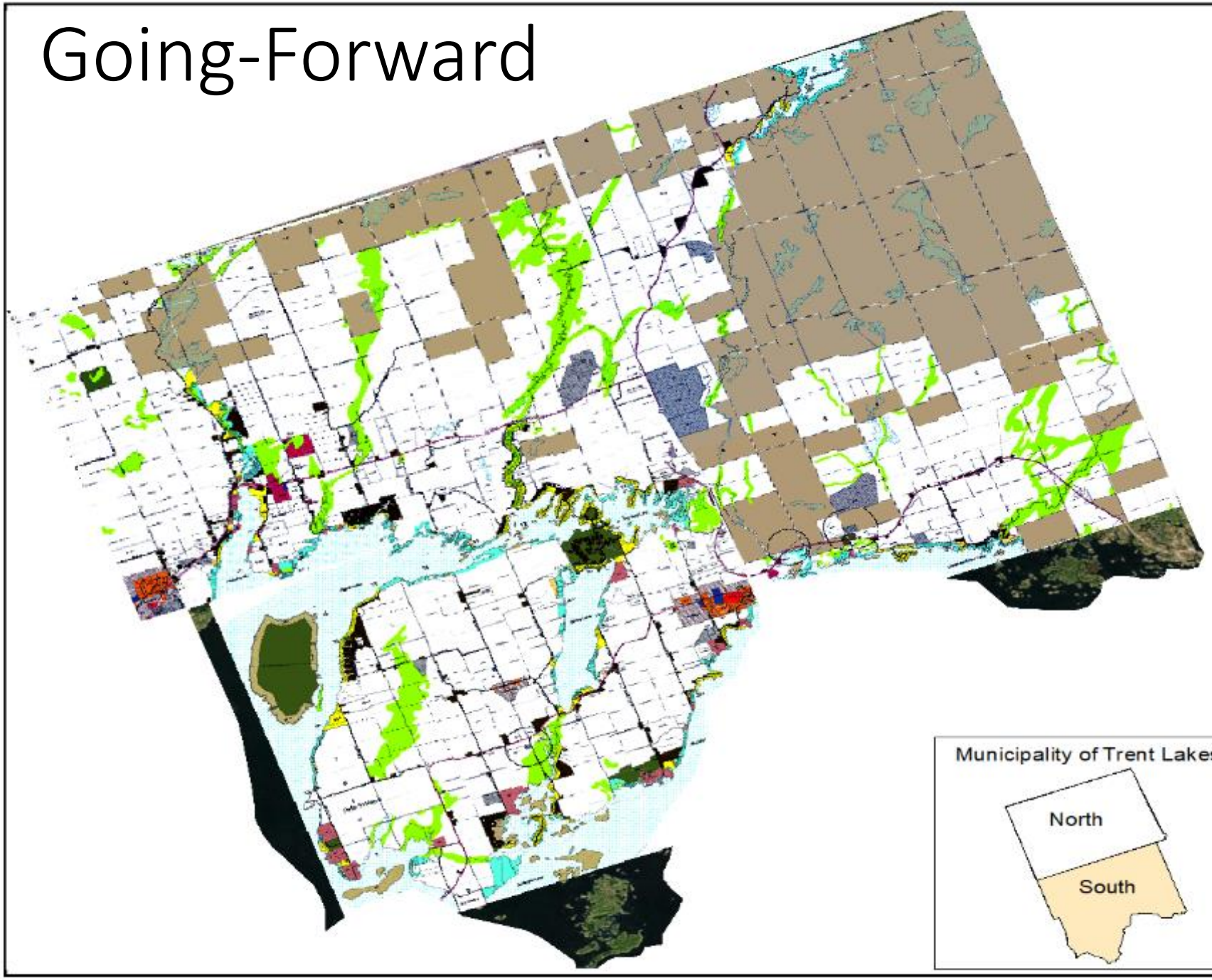
Going-Forward



Trent Lakes Municipality

Schedule A to By-Law and Planning
South

N

Legend

- Crown Land
- Rural
- Environmental Protection
- Shoreline Residential
- Hamlet Commercial
- Shoreline Residential-Private Access

Municipality of Trent Lakes

2 1 0 2 4 6 Kilometers

1:100,000

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