

Using GIS to Support Land Use Planning and Solid Waste Management

Thursday, January 12th 2023

10:00 AM PST / 1:00 PM EST

 Change tool



Welcome



AGENDA



RC GIS Presentation



CLSS Webmap Browser



Cadastral Fabric and
Flood Plain Analysis



Mute Devices



Recorded Session



Closed Caption



Presentation &
Materials



Interactive
Discussion

Today's Speakers



ADAM WRIGHT

Planner, Land Code Governance
RC



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RC



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RC



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Geomatics Officer,
Surveyor General Branch, NR Can



JONATHAN FREDERICK

Senior Surveyor, Alberta Region,
Surveyor General Branch, NR Can



FRANCE PAQUET

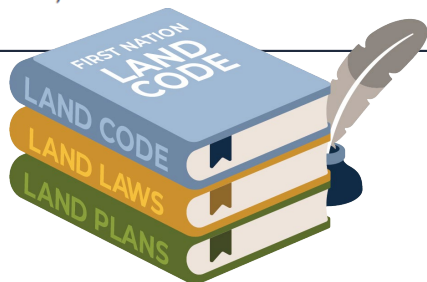
Geomatics Specialist ,
Surveyor General Branch, NR Can

Land Use P



What

Land-use planning refers to a wide range of activities that **direct the future use of land (development planning) and control the current use thereof (development management)**. The aim is to ensure the optimal use of land within a political, social, cultural, environmental and economic context.



Planners work across fields, such as:

economic development

land use planning

development

environmental resource management

social planning

heritage conservation

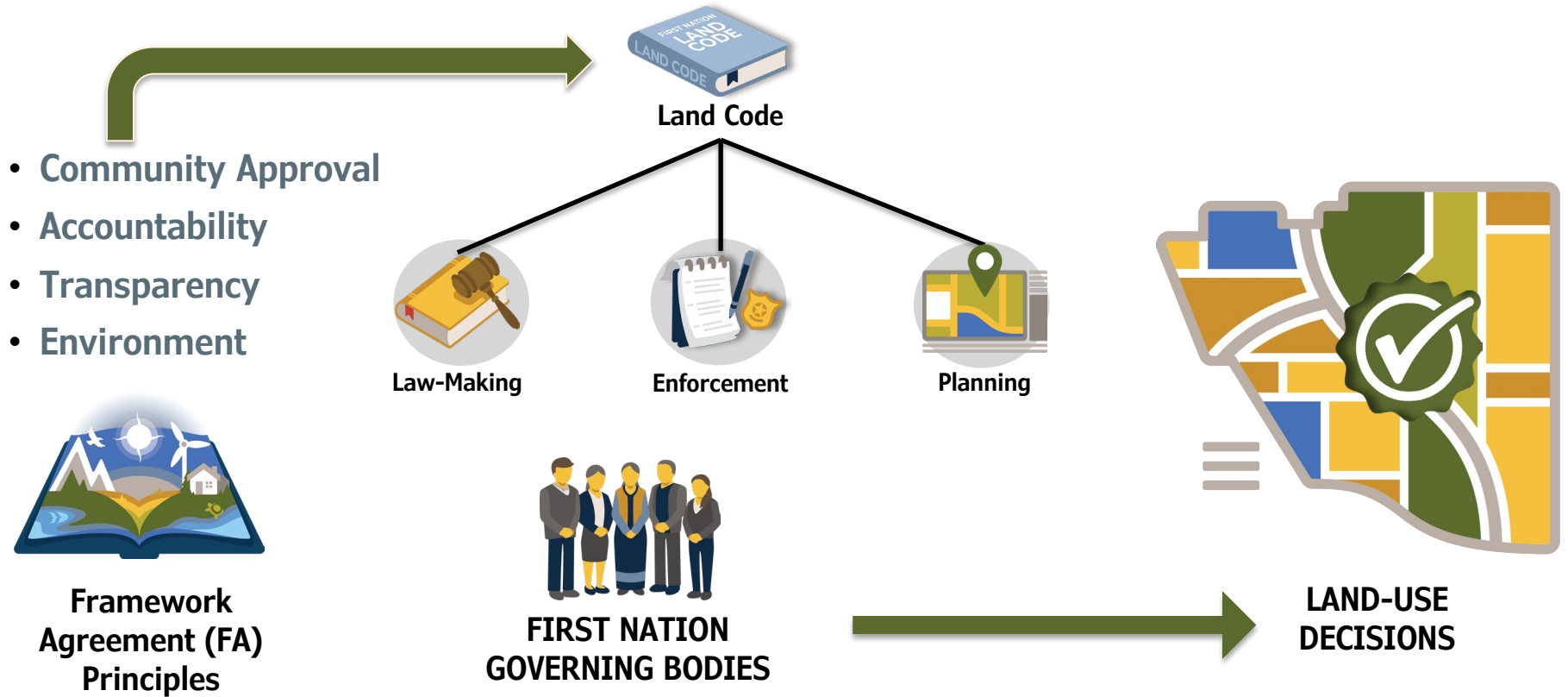
Learn more at cip-icu.ca

Lands Governance Planning

Lands Governance Planning is a diverse, multi-disciplinary professional field that encompasses multiple areas of practice and specialization relative to the values, goals and capacity of each First Nation.

- Community Planning
- General land-use & development
- Long term land-use planning
- Residential & commercial planning & development
- Regional planning
- Transportation planning
- Social & policy planning
- Housing planning & policy
- Heritage planning & policy
- Environmental planning
- Parks & recreation planning
- Resource management planning
- Economic development

Linking Planning with the Principles of the Framework Agreement



Examples of First Nation Land Laws & Planning Processes



**Land Use, Zoning,
and Development**



**Allotment,
Interests, & Licences**



**Environmental
Assessment & Protection**



**Natural Resource
Management**



**Trespass, Enforcement,
& Ticketing**



Residential Tenancy



**Business Permitting &
Licencing**



**First Nation
Expropriation**

Planning Processes Under the Framework Agreement (FA)

Laws that Regulate Land Development

*(not an exhaustive list)

- Zoning Laws
- Development Laws
- Envi. Protection Laws
- Community Quality Laws
- Design Laws / Guidelines

Policies and Plans that Guide Land Development

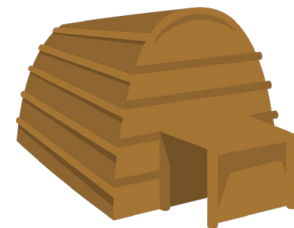
- Community Plans
- Land Use Plans
- Forest Management Plans
- Cultural Heritage Policy
- Consultation Protocol
- Comprehensive Community Plans
- Land Registry Policy

Procedures and Tools to Guide Projects

- Land Development Procedures
- Development Application Form
- Checklists & Guides
- Environmental Laws (checklist)
- Zoning Laws (checklist)
- Invoicing / Contracts / Fee Schedules
- Leases

GIS DATA = Foundational Data for Planning

- Traditional Knowledge Studies
- Identify Areas of Protection / Development
- Watershed Mapping / Ecosystem Mapping
- Hazards / Contamination Mapping
- Protection of Culturally Sensitive Lands



LUP & GIS – Mapping is an essential planning tool

- Mapping is a critical component and support tool for meaningful Community engagement.
- Mapping is an important tool in developing a vision for the Community and Community lands.
- Accurate mapping is the foundation of an effective and legally enforceable Land Use Plan.



GIS Technicians and Planners – Dynamic Duo

- Owing to the integral nature of GIS and mapping data in Lands Governance and Planning processes, there is immense potential for GIS technicians and planners to support each other in their respective tasks.



- Additionally, when GIS technicians and planners work together they support capacity development and growth in each person's career.



- Planners and GIS technicians working together can also help find innovative solutions to the unique challenges that First Nations encounter in Lands Governance.



Flexibility of Planning Documents

- The format of Land Use Plans and Planning documents are flexible.
- In their simplest form, a Land Use Plan is a communication tool.
- At the start of the planning process, it's good to determine who you are communicating with which will then help identify the best format to use.
- For example, if you are using a LUP to support Community-based decision-making than a story-telling approach may be more impactful. Conversely, if you are using a LUP to regulate and guide development and LUP law may be more effective.



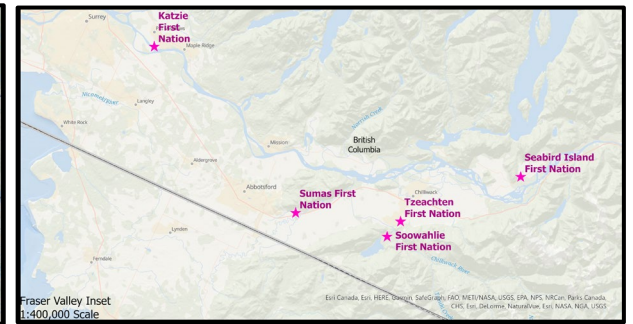
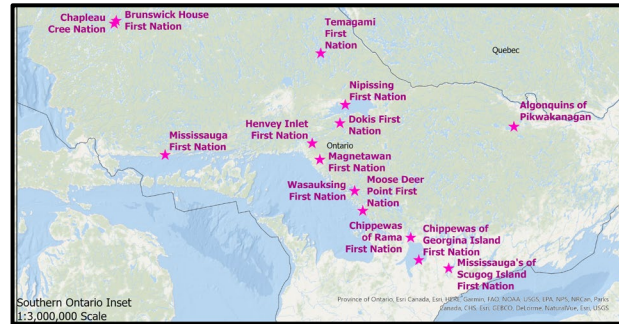
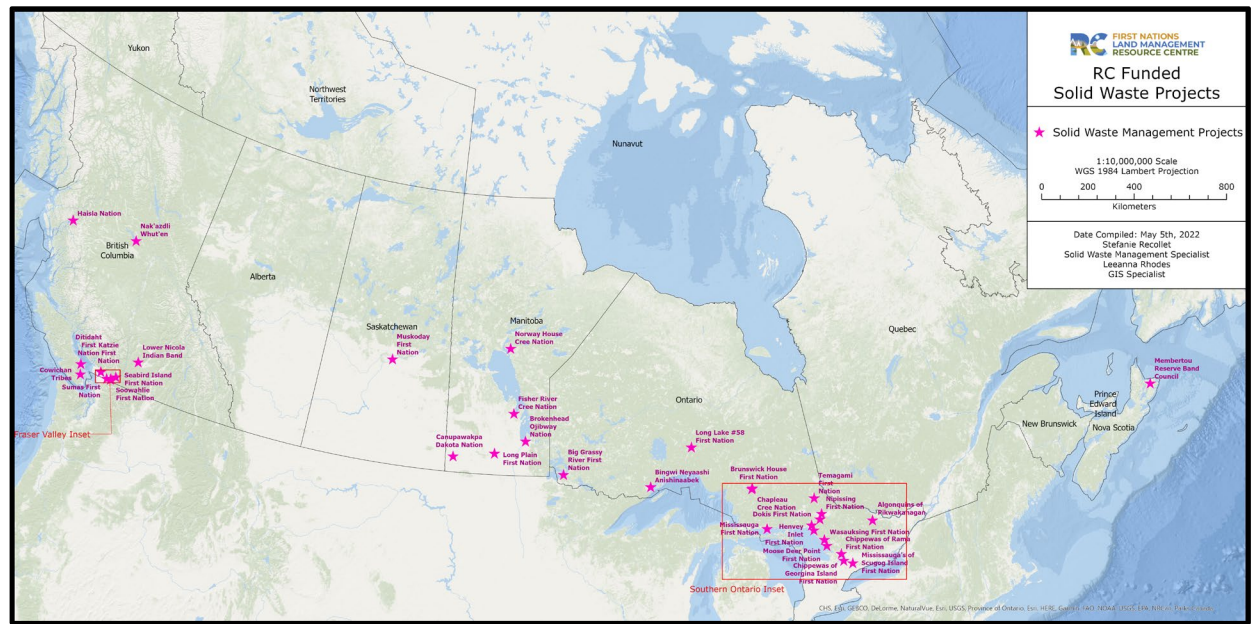
- **ArcGIS Story Maps is one example of a web-based format that enables the power of GIS and digital story-telling.**



[Sounds of the Wild West \(arcgis.com\)](https://arcgis.com)

RC Funded Solid Waste Projects

Current Practices &
Capital Infrastructure
inventory of each
applicant First Nation



Understanding SWM Legacy Issues

MAPPING LEGACY ISSUES

- Old dumpsites
- Monitoring wells
- Waste Site Decommission and Closure
- Clean-up of the waste sites (surficial removal, controlled public access, etc.)
- Decommissioning of waste sites
- Post-closure monitoring

- APEC 5 Mamit Lake Road Four Mile Dump;
- APEC 6 Buried Dump 1 Mamit Lake Ranch Road South; and
- APEC 7 Buried Dump 2 Mamit Lake Ranch Road South

Note that both APEC 5 and APEC 7 comprise the two blue markers nearest the given site.

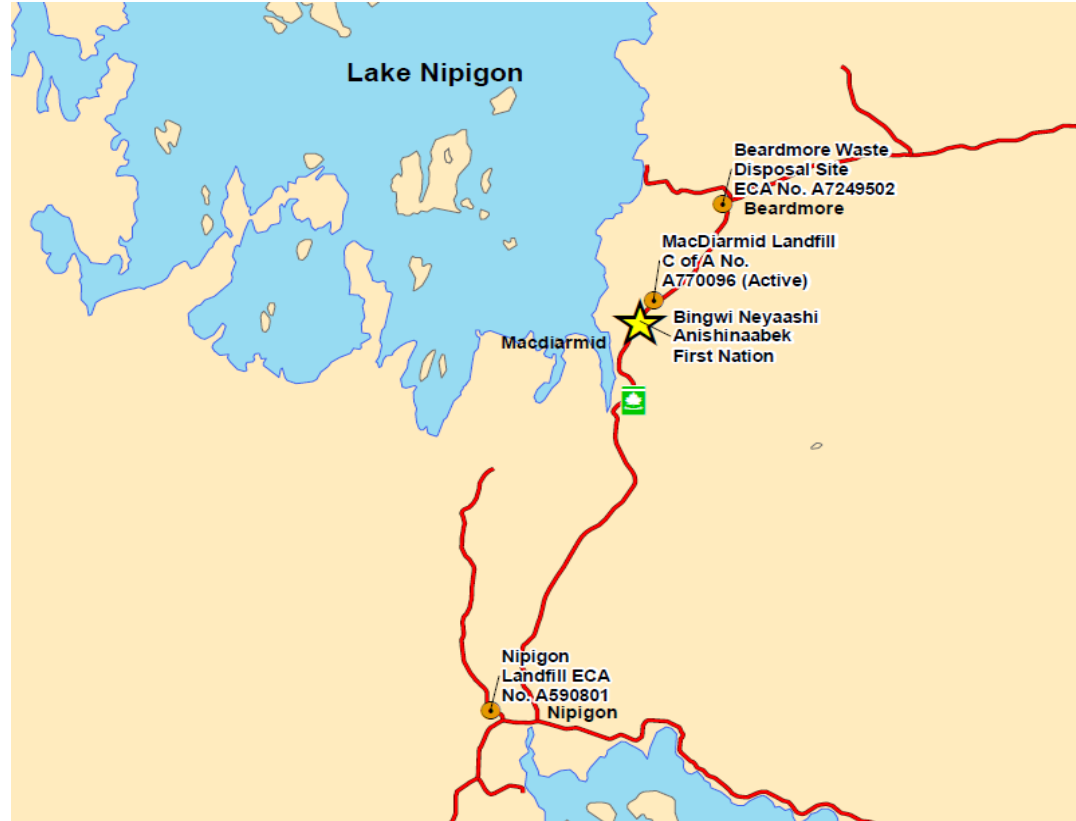


Figure 2 – Three dump sites visited on March 3: APEC 5, APEC 6, and APEC 7

Waste System Design: Determining Feasibility

FEASIBILITY STUDIES

- Proximity to Material Recovery Facilities
- Other waste disposal sites
- Determine whether to Direct Haul, build a Transfer Station or Landfill

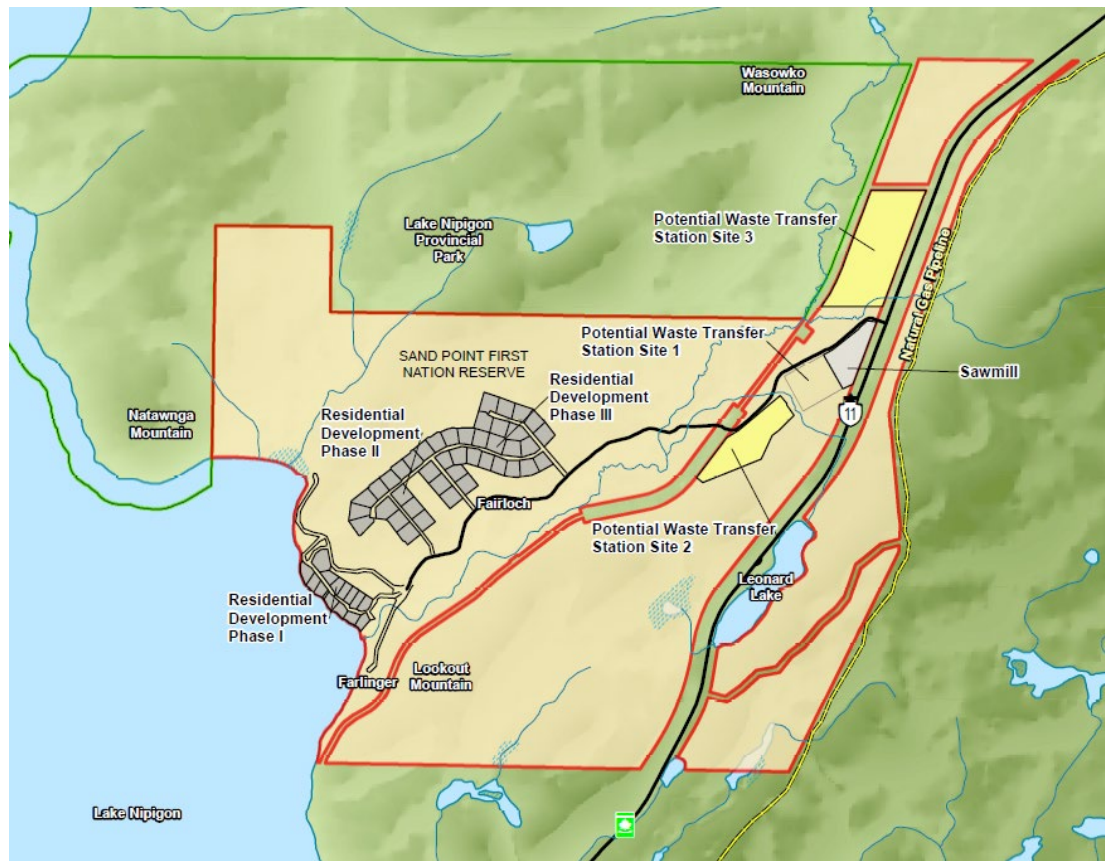


Waste System Design: Site Selection

COMMUNITY CONSULTATION

Siting principles:

- Centrality to waste source
- Site size requirements
- Access to Utilities
- Expansion considerations

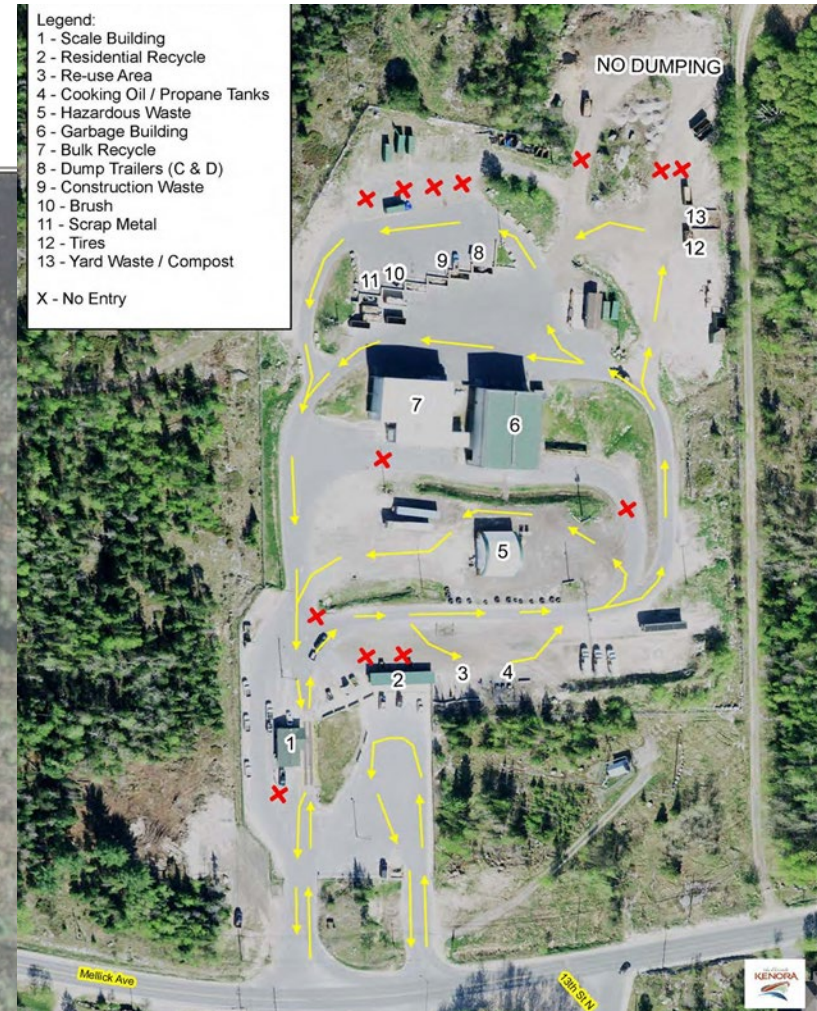


Waste System Design: Site Design

- Traffic flows
- Accounting for noise, dust and aesthetics
- Fire breaks
- Service road/corridors
- Site Drainage and control run off

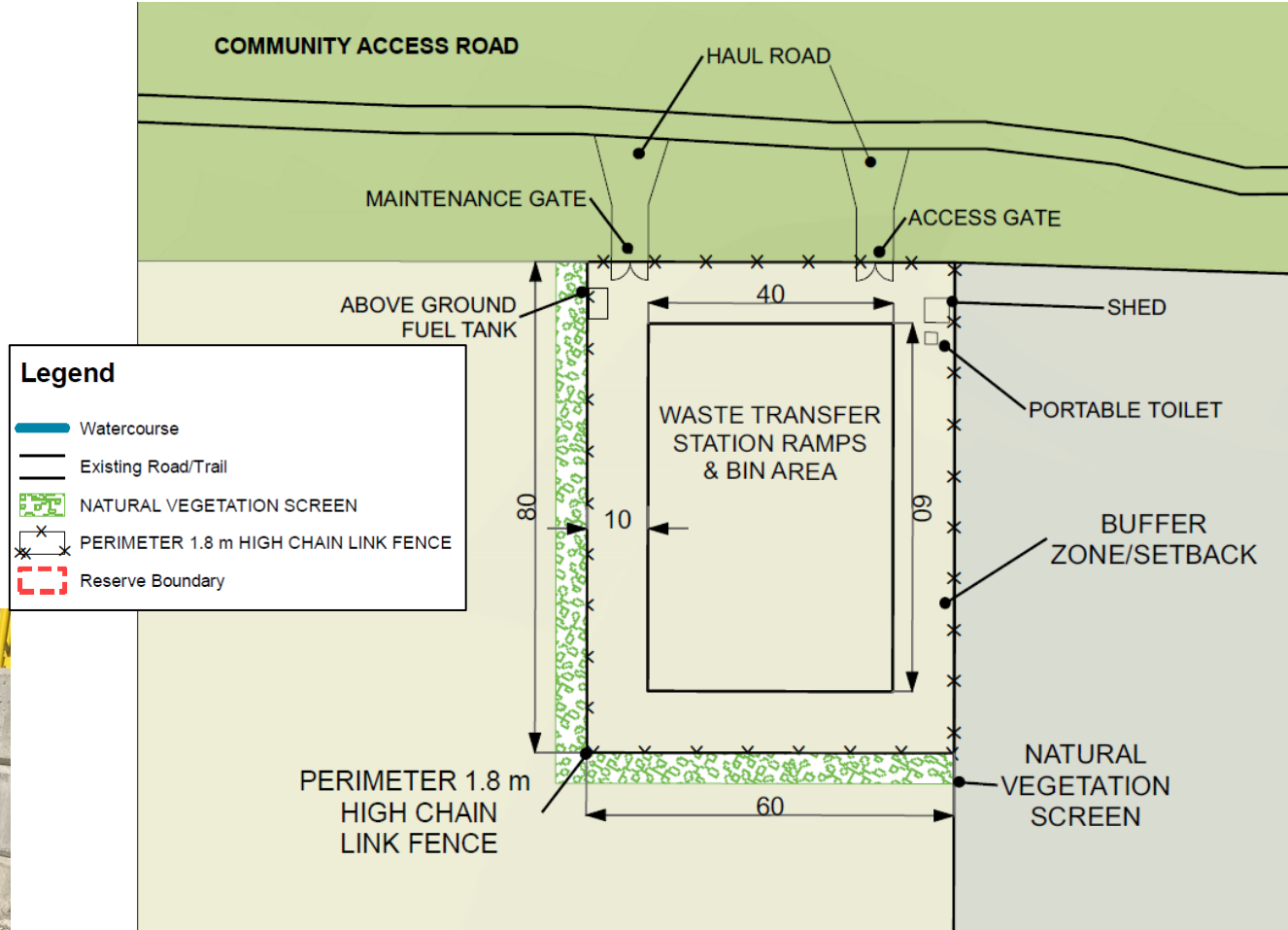


- Legend:
- 1 - Scale Building
 - 2 - Residential Recycle
 - 3 - Re-use Area
 - 4 - Cooking Oil / Propane Tanks
 - 5 - Hazardous Waste
 - 6 - Garbage Building
 - 7 - Bulk Recycle
 - 8 - Dump Trailers (C & D)
 - 9 - Construction Waste
 - 10 - Brush
 - 11 - Scrap Metal
 - 12 - Tires
 - 13 - Yard Waste / Compost
- X - No Entry



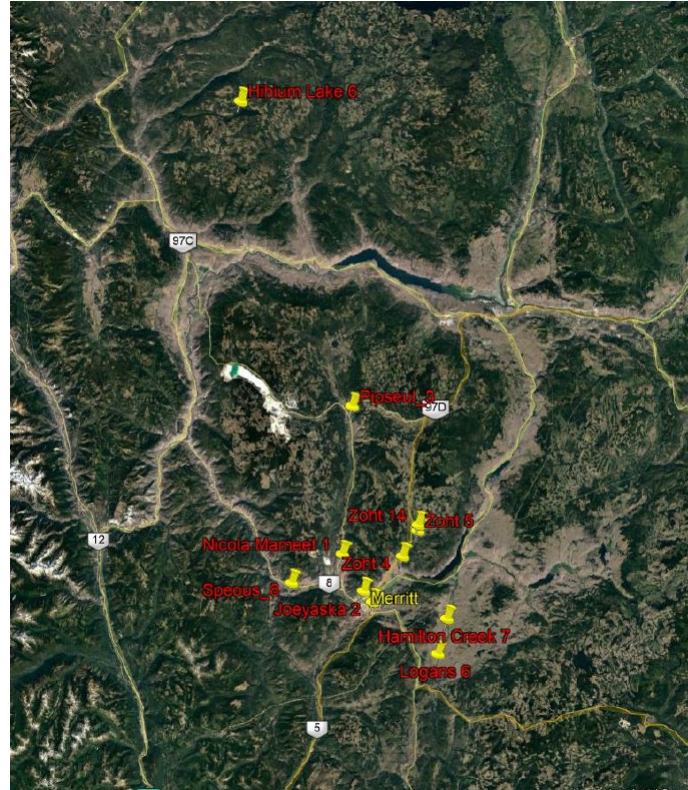
Waste System Design: Site Lay Out

- Site building
- Storage capacity
- Loading bays
- Drop off points
- Buffer zones
- Contaminant control
- Weather protection



Waste System Design: Determining Serviceability

- Service Area
- Level of Service
- Material – types collected
- Collection routes



Waste System Design: Environmental Monitoring Programs

SETTING UP MONITORING PROGRAMS

- Current dumpsites
- Location of Monitoring wells
- Hydrogeological layers to determine water flows
- Surface water and groundwater



Waste System Design: Environmental Monitoring Programs

MAPPING AND REPORTING ILLEGAL DUMPSITES

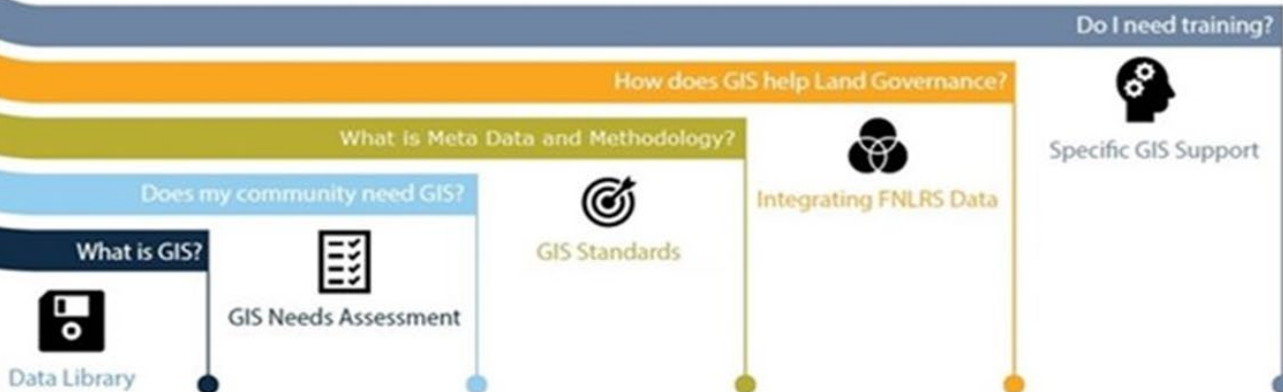
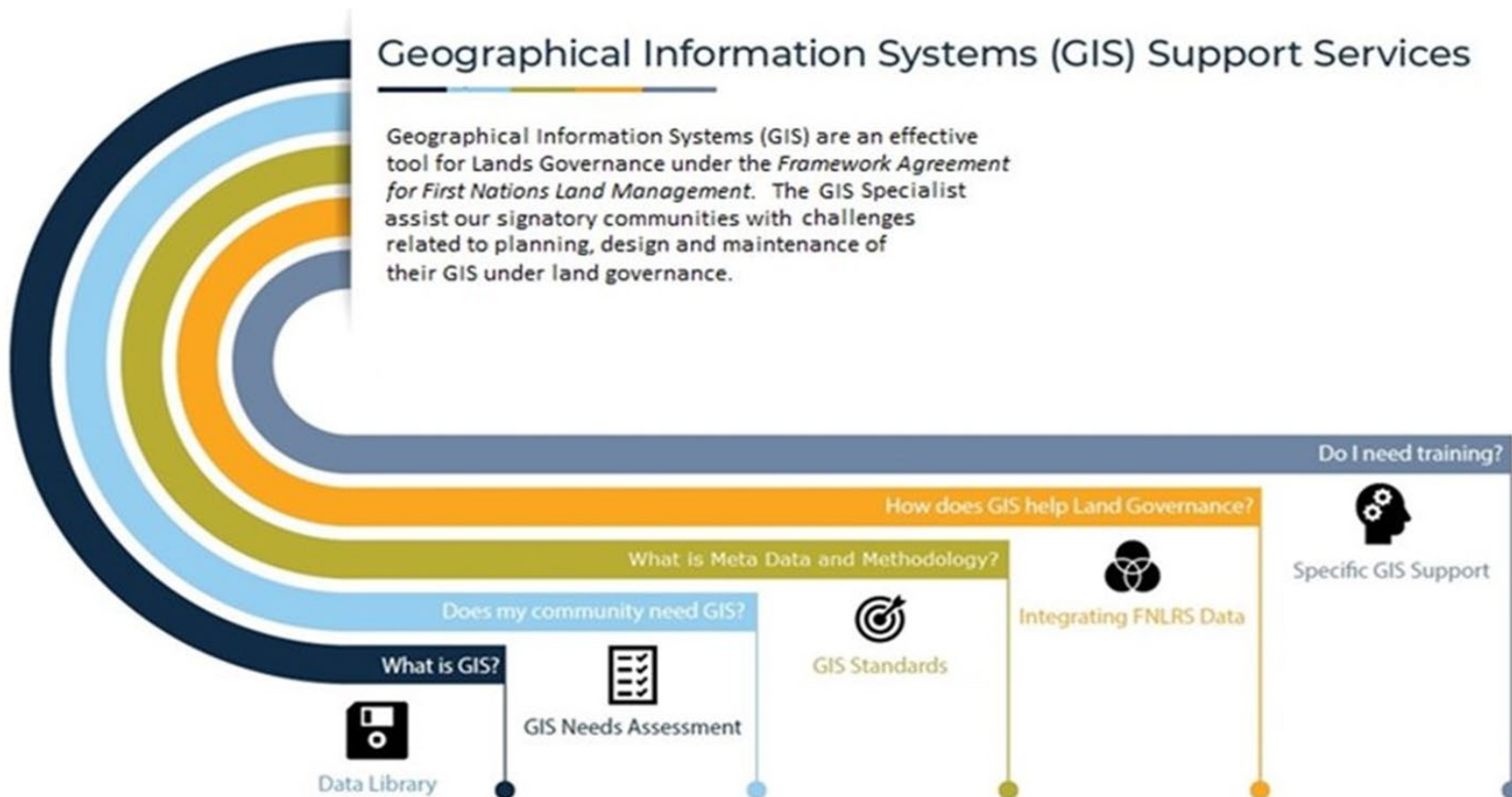
- How to report dumpsites
- GPS & Inventory of sites



Figure 9 – Small, undesignated dump site in the vicinity of APEC 6 and APEC 7

Geographical Information Systems (GIS) Support Services

Geographical Information Systems (GIS) are an effective tool for Lands Governance under the *Framework Agreement for First Nations Land Management*. The GIS Specialist assist our signatory communities with challenges related to planning, design and maintenance of their GIS under land governance.



GIS Working Group

- Governing the land with mapping software
- Discuss mapping challenges
- Collaborate on best practices
- Walk through instructions
- Share tips, tricks and solutions
- Meetings recorded for those who need refresher



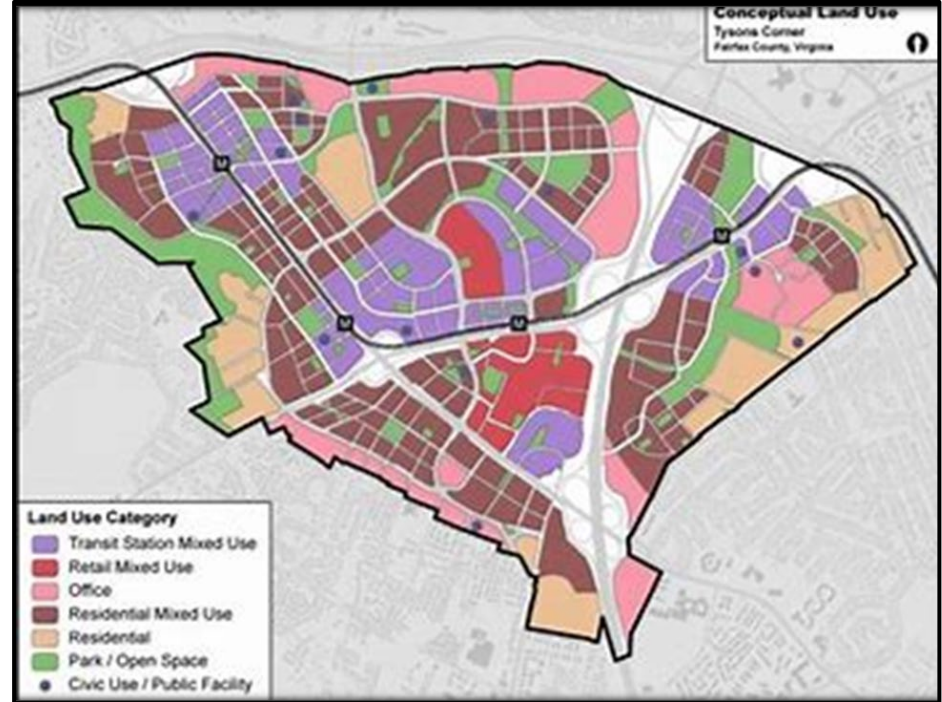
Mapping the Plans

LAND DEVELOPMENT AND LAND USE PLANNING

- Visioning, Development Concepts
- Land Use & Zoning
- Surveying Subdivisions
- Development Permitting
- Compliance Monitoring

ENVIRONMENTAL MANAGEMENT PLANNING

- Natural Areas & Parks
- Protect/Manage Water quality (surface & groundwater)
- Soil/River embankment quality
- Plan for Climate Change
- Map results from Environmental Site Assessments



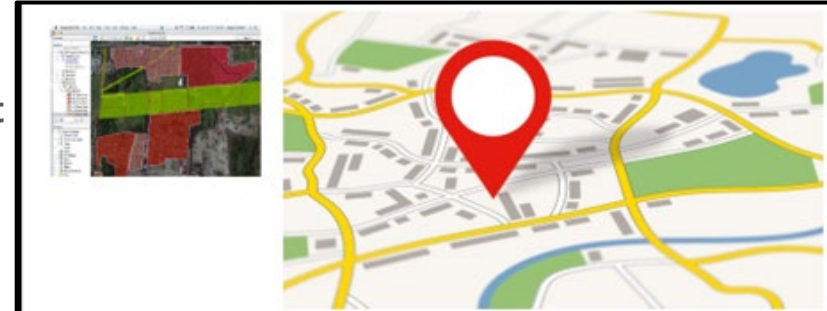
Map Work Progression

LAND USE PLANNING INFORMATION

- Areas that were identified in Community Engagement
- Land classification as defined by the land users
- Digitizing new boundaries - use natural boundaries with existing Land Parcel Information
- Overlay Resource layers such as forestry, plant inventory and access routes.

GIS PROCESSES

- Acquire existing data
- Digitize from Hardcopy Maps
- Transformations and Projections
- Overlaying and Accuracy (alignment)
- Analyzing the information
- Confirm the information



DIGITAL DATA



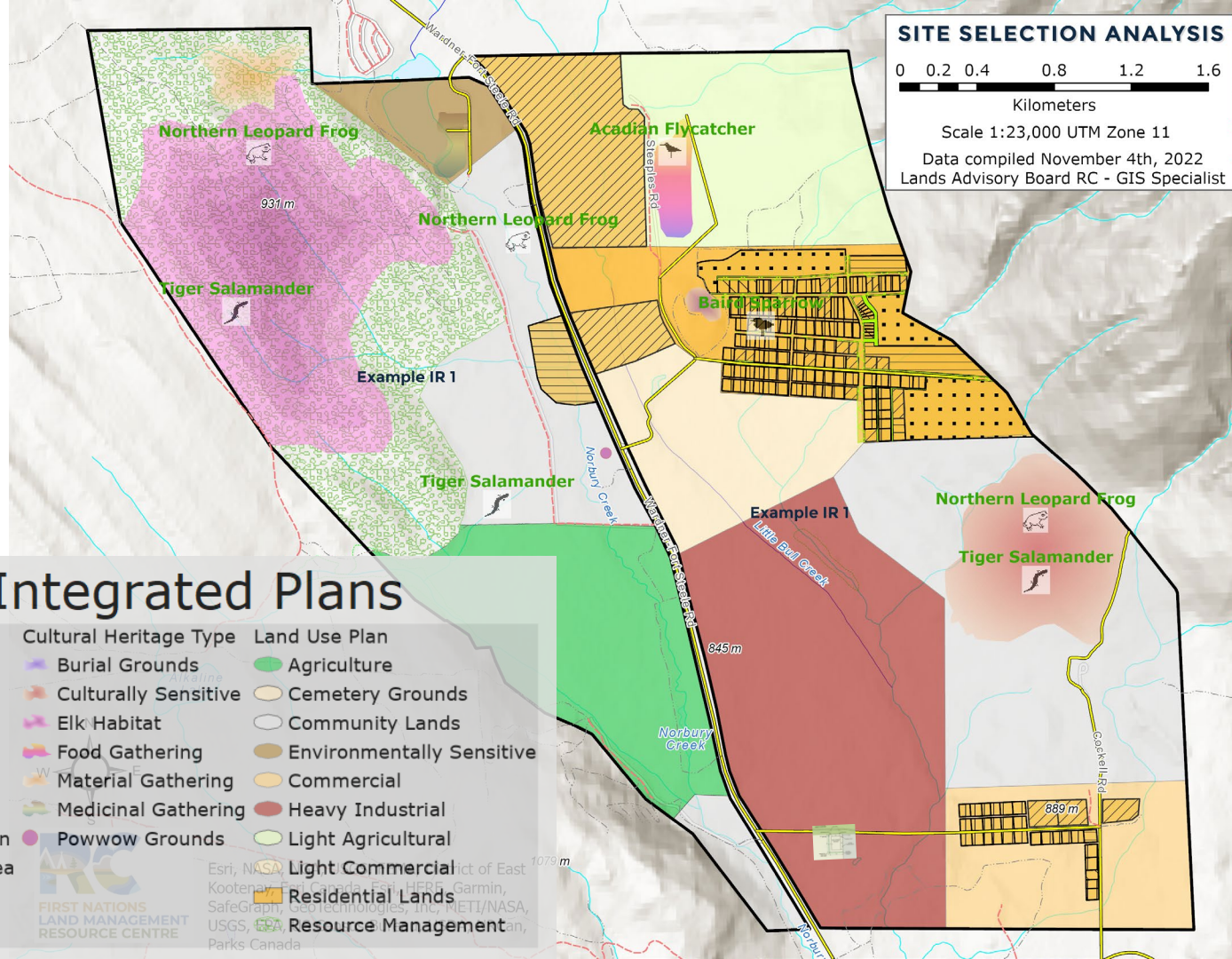
GIS Analysis - Solid Waste Management Transfer Station

- Access routes – compatible with community use
- Locate nearby water/river/lake layer
- If flood zone information is available, use this in the analysis as well
- Forests and wildlife/Species at Risk and Wildlife habitat
- Confirm proper riparian management zones are being used
- Visualizing relationships of all land uses to best define an appropriate site selection



Moving forward

- GIS Analysis
- DEM Analysis
- Flood plain overlays
- Species at Risk
- Invasive Species



Example IR1 Integrated Plans

Endangered Species Name	FNLRS Type	Cultural Heritage Type	Land Use Plan
Acadian Flycatcher	Band Land	Burial Grounds	Agriculture
Baird Sparrow	Permit	Culturally Sensitive	Cemetery Grounds
Northern Leopard Frog	Lease	Elk Habitat	Community Lands
Tiger Salamander	Sub Lease	Food Gathering	Environmentally Sensitive
Paved Roads	Easement	Material Gathering	Commercial
Gravel Roads	Road (ROW)	Medicinal Gathering	Heavy Industrial
Rough Roads	Lawful Possession	Powwow Grounds	Light Agricultural
Surface Unknown	Administrative Area	Residential Lands	Resource Management

Questions & Discussion



Canada Lands Survey System

Define, mark and describe
Boundaries of Canada Lands



CLSS has two Programs

Survey Registry
Survey Program



Canada Lands Survey Records

Surveys create demarcation on ground
Approved Surveys enter CLSR as plans



Using GIS to Support Land Use Planning & Solid Waste Management

- Explore how GIS assists in Land Use Planning
- What processes are considered for Solid Waste Management
- GIS Analysis for Site Selection of a Solid Waste Management Station
- Live Demo by NR Can – on My CLSS with FNLRS Parcel Abstract Report



2023 EVENT SCHEDULE

Online Registration:
labrc.com/events

Feb
09

Implications
of the new
legislation –
FAFNLMA

Virtual
Webinar

Mar
8-9

RC Support
Services
Workshop

Virtual
Workshop

Apr-
May

FNLRS
Training
Sessions

Regional
Workshops

Mar
30

FNNLR
Update

Virtual
Workshop



Jun
6-8

LAB-RC
Enforcement
Conference

Gatineau-
Ottawa, QC



T M Training, Mentorship &
P D Professional Development

Workshops & Webinars

Online Courses

Knowledge Paths Tool

Land Governance Manual

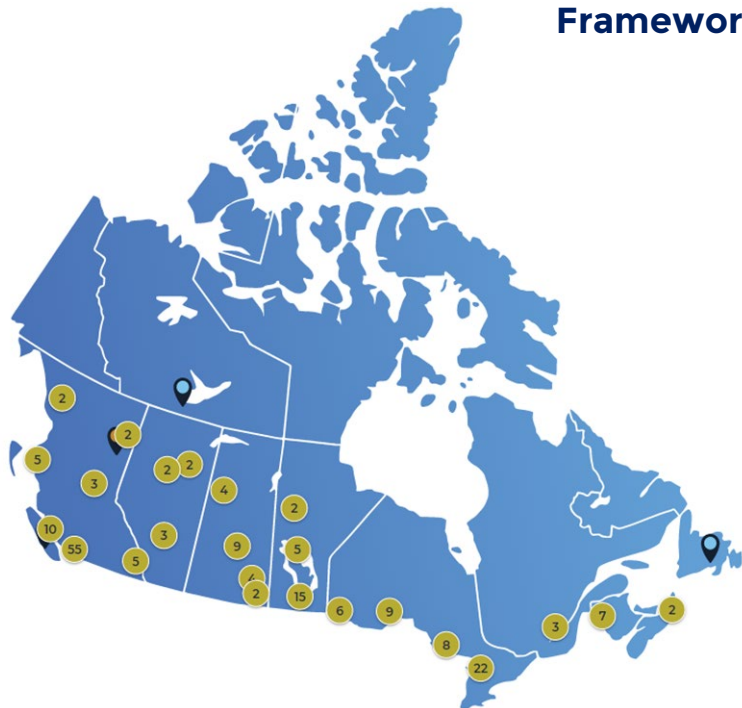
Knowledge Repository

Direct Community Support (1:1)



Framework Agreement Signatory First Nations across Canada

As of January 11, 2023



Total Signatories	194
Operational	101
Developmental - Active	44
Developmental – Inactive	46
Self Governing	3

[Lands Advisory Board](#) >[Resource Centre \(RC\)](#) >[Our History](#)[RC Board](#)[RC Staff](#)[Employment Opportunities](#)[RC Reports](#)

Employment Opportunities

SEARCH JOBS

 Full Time Part Time Temporary

First Nations Land Registry Advisor
First Nations Land Management Resource Centre

Remote - Within Canada

Full Time



WORKSHOP COORDINATOR: First Nations Tax Commission
First Nations Tax Commission

Tulo Centre, Kamloops

Full Time

THANK YOU



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