### MCK ENVIRONMENTAL CONTAMINANTS HEALTH IMPACT PROJECT (ECHIP) 2019-PRESENT

# A COMMUNITY-LED PROJECT IN KANESATAKE

Mohawk Council of Kanesatake Ratishontsanonhstats Kanesatake Environment in collaboration with TerraHumana Solutions and McGill University Faculty of Agricultural and Environmental Sciences, Centre for Indigenous Peoples' Nutrition and

Environment



# TODAY'S GOAL

- To present the team community members, academics and researchers
- To show you the why, how and where of the project
- To present preliminary findings we are in our wrap-up year of the project (to be completed March 2024)
- To let you in on the next steps
- To present the new project stemming from this one
- \*To answer any questions\*









Mary Nicholas





Valerie Gabriel





Timothy Cree

Colin Nicholas





Ratishontsanonhstats Kanesatake Environment staff



Tianai Zhou

Nikita Bhat



Katie Chong





Isabelle-Anne Bisson





The project was successfully funded from 2019 to 2024 by the First Nations Environmental Contaminants Program, Environmental Public Health Division – FNIHB, Department of Indigenous Services Canada

# PROJECT GOAL

To perform a preliminary scoping analysis of the contaminants that are suspected to be in the soil, food and water to understand the potential health risks associated with the contaminants.

The project was divided into two main components:





- Identifying the type and quantity of contaminants suspected to be present in the soil, food (grown or harvested and ingested on the territory) and water (surface land water and tap water).
- Focus on heavy metals





 Human Health Risk Assessment (HHRA) for community members most at risk of exposure (e.g., those living in identified areas of concern near waste dump sites, and those who ingest food grown from the local environment).





### PROJECT TIMELINE 2019-2022 A COMMUNITY-DRIVEN INITIATIVE







### CONTAMINANT CHARACTERIZATION

- Identifying the type and quantity of contaminants suspected to be present in the soil, food (grown or harvested and ingested on the territory) and water (surface land water and tap water).
- Focus on heavy metals



# METHODS – CONTAMINANT CHARACTERIZATION

Soil – 1cm & 18 cm depth

Plants – medicinal, food

Water – natural waterways, tap











Heavy metal concentrations exceeding (in red) the Canadian Environmental Quality Guidelines (CEQGs) as defined by CCME.

Site	Heavy Metal (mg kg <sup>-1</sup> )				
	Chromium (Cr)	Nickel (Ni)	Zinc (Zn)	Lead (Pb)	
CPH 6	21.6	15.1	94.5	66.0	
СРН 38	16.9	45.3	331.4	15.6	
СРН 40	90.6	44.4	96.0	13.3	
CPH 49	60.5	81.4	68.2	8.9	
СРН 50	27.3	23.1	99.5	75.1	
CPH42	17.4	10.3	280.5	42.7	
CPF9	21.3	16.3	373.3	77.81	
CCME guidelines	64	50	200	70	

CP = contaminants project

H = area of concern

F = farm

R = random

CCME – Canadian Council of Ministers of the Environment



Site name -plant type	Heavy Metal (mg kg <sup>-1</sup> )		
	Cadmium (Cd)	Lead (Pb)	Arsenic (As)
F4-rhubarb	0.11	0.17	0.04
F4-sweet flag	0.18	1.74	0.14
F4-sweet pepper	0.26	0.03	0.02
F4-chocolate mint	0.01	0.18	0.03
F10-fern	0.10	0.37	0.08
F13-carrot	0.22	2.23	0.56
R43-oyster mushroom	1.91	0.04	0.00
H28-wild carrot	0.12	1.60	0.34
H49-parsley	0.04	0.28	0.07
H49-tomato	0.06	0.05	0
EC guidelines	0.05	0.1	0.1



RESULTS CONTAMINATED SITES- PLANTS \*\*SUBJECT FOR REVISION\*\*



Heavy metal concentrations exceeding the maximum level allowed (in red) in World Health Organization (WHO) drinking water guidelines (WHO 2017).

Water Sample	Nickel (Ni) Concentration (µg/L)
F13 (tap water)	115.48
WHO drinking water	70

Additionally, 10 tap water samples were tested for persistent organic contaminants (petroleum hydrocarbons and Polycyclic Aromatic Hydrocarbons). <u>All were within regulatory limits.</u>



### HUMAN HEALTH RISK ASSESSMENT

For community members most at risk of exposure (e.g., those living in identified areas of concern near waste dump sites, and those who ingest food grown from the local environment). Survey used was adapted from the First Nations Food, Nutrition and Environment Study (FNFNES, <u>http://www.fnfnes.ca</u>) designed for the Quebec/Labrador region. Study conducted by Caroline Raymond & Katie Chong (McGill students) with Valerie Gabriel and Tess Lalonde as community researchers

**Excerpt from survey:** 

#### 2. TRADITIONAL FOOD AND WATER QUESTIONNAIRE

This section contains 2 parts:

The first part asks about the traditional foods that you have eaten in the past year and how often you ate them.

The second part asks about the sources of water in your house.

#### Traditional food frequency questionnaire

This part is about traditional food – that is, food harvested within the local environment. It can be in any form – for example: dried, smoked, fermented, fresh, frozen...

I will begin by asking about fish that were harvested within the past year.

#### A. In the past year, have you eaten any FISH?

Yes  $\Box$  I will now ask you which fish you have eaten in the past year and the number of times that you believe you ate this food in each season.

No 
(If No, go to next section - LAND MAMMALS)

27 participants – 11 interviewed prior to COVID and resumed in 2022

# METHODS – HUMAN HEALTH RISK ASSESSMENT

METHODS – HUMAN HEALTH RISK ASSESSMENT Biological sample collection – summer 2022 14 hair and urine samples from the 27 consenting participants

51-70 accounts for the majority of 'Age group'.



# RESULTS – HUMAN HEALTH RISK ASSESSMENT



#### 27 participants

Most participants were in the  $51\mathchar`-70$  , and the  $31\mathchar`-50$  age groups



### Three main findings:

Topic of traditional foods	Kanesatake	Other Regional Nations	Other Nations Nationally
Most frequently consumed	Trout, deer, wild turkey, wild strawberries, wild onion (leek), & corn	Walleye, moose, Canada goose, blueberries,& Labrador tea	Salmon, moose, duck, blueberries, & Labrador tea;
Impediment to access	Lack of time	Lack of time	Insufficient resources
Benefits	Natural and safe nature	Healthy and nutritious	Healthy and nutritious

Water – mostly bottled and not tap Biological samples to be processed this summer

# HUMAN HEALTH RISK ASSESSMENT IN KANESATAKE, A UNIQUE COMMUNITY

# Treading The Murky Depths of Environmental Racism Nikita Bhat

# The Story of Environmental Contamination in Kanesatake Introduction

The issue of toxic contamination and environmental destruction of First Nations lands is a pervasive issue across Canada. The aim of this paper is to document historical data and community knowledge through the underlying themes of environmental racism and the lack of environmental justice that perpetuates the hazardous patterns of cultural, spiritual, and environmental

# **KEY FINDINGS**

- Capacity building four community members were trained;
- Site Identification Over 100 sites identified as areas of concern by community members;
- Sampling and testing Of the more than 100 sites sampled (including of concern, farm and random), over 60% tested;
- Sample bank Remaining samples are kept frozen here in Kanesatake;
- Contaminants levels surpassing regulatory limits of heavy metals found in 18 sites;
- Health and diet Kanesatake is unique and community members value traditional foods

These pilot findings provide a solid foundation to explore deeper, and to catalyze efforts to better monitor, assess, and remediate contaminated sites.

# OUTREACH

- Kanesatake Health Fair 2019
- COVID led to some delays in the progress
- Mohawk Council in spring 2021
- Community presentation 23 May 2023



# **KEY FINDINGS & NEXT STEPS**

- Capacity building four community members were trained;
- Site Identification Over 100 sites identified as areas of concern by community members;
- Sampling and testing Of the more than 100 sites sampled (including of concern, farm and random), over 60% tested;
- Sample bank Remaining samples are kept frozen here in Kanesatake;
- Contaminants levels surpassing regulatory limits of heavy metals found in 18 sites;
- Health and diet Kanesatake is unique and community members value traditional foods
- Continue training for one community member in Dr. Basu's lab
- Sample contaminated sites for other pollutants
- Final presentation in 2024

# NSERC ALLIANCE, 2023-2028

- Title: Indigenization of New Approach Methods for Contaminated Sites Assessments in Indigenous Communities: A Community-Based Case Study in the Kanien'kéha:ka community of Kanesatake
- \$250K/yr x 5 years
- Ratishontsanonhstats Kanesatake Environment + TerraHumana Solutions + McGill's Center for Indigenous Peoples' Nutrition and Environment (CINE)
- Continue, and expand upon, the ECHIP project
  - Advance on-going community-based monitoring
  - Focus especially on the G&R site before, during, and after remediation
  - Co-develop tools, methods, knowledge, etc. to better monitor and assess contaminated sites at Kanesatake, and elsewhere





### NIA:WEN KOWA TO ALL COMMUNITY MEMBERS WHO PARTICIPATED – SAMPLING AND HHRA

# FIRST NATIONS ENVIRONMENTAL CONTAMINANTS PROGRAM FOR COMMUNITIES AND ORGANIZATIONS SOUTH OF 60TH PARALLEL



Indigenous Services Canada Services aux Autochtones Canada

Canada



