

# Community Impacts of Fuel Spills: A Case Study from BC's Central Coast

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# Outline: Three Parts

1. Health effects of oil spills
2. Case Study: Bella Bella Diesel Spill
3. Preparedness and Response: Health Canada Guidance Document



# What have large marine spills taught us about effects on human health?

- *Deepwater Horizon (USA)*
- *Hebei Spirit (South Korea)*
- *Prestige (Spain)*
- *Exxon Valdez (USA)*
- *Tasman Spirit (Pakistan)*
  
- Short paper: [www.ncceh.ca](http://www.ncceh.ca)
- Long paper: [www.vch.ca](http://www.vch.ca)



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## Health Effects of Oil Spills and Implications for Public Health Planning and Research

Angela Eykelbosh, MSc, PhD



### Introduction

Two major pipeline projects have been proposed to transport petroleum products from Alberta to the British Columbian coast. Despite potential economic benefits, these proposals have roused widespread public concern regarding the health and ecological consequences of a major marine or terrestrial spill. In Metro Vancouver, the Trans-Mountain pipeline expansion will triple the volume of petroleum products entering this densely populated urban area. In 2014, local municipalities requested Vancouver Coastal Health and Fraser Health to gather information on the potential impacts of oil spills on human health. What follows is a summary of literature reviewed on behalf of the Office of the Chief Medical Health Officer, Vancouver Coastal Health.<sup>1</sup>

### Background

A Greater Vancouver-Area Health Authority reviewed oil-spill related research in order to inform the assessment of Vancouver and other BC municipalities of pipelines and coastal petroleum transport off their shores.

### Methods

The review included epidemiological and sociological studies examining the short- and long-term impacts of oil spills. Various combinations of the key words related to potential impacts, impact

### Key Messages

#### Physical Health Impacts

The academic literature shows statistically significant associations between oil spill exposure and a number of short- and potentially long-term physical health impacts, particularly among spill clean-up workers.

#### Mental Health and Community Health Impacts

Evidence of mental and community health effects is growing, and may affect a wider population base (individuals, families, and communities) with potential long-term effects.

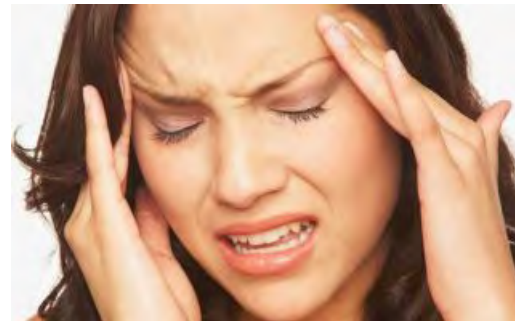
#### Mitigating Health Impacts

Health impacts may be mitigated through the use of personal protective equipment, additional health service provision, and the alleviation of financial uncertainty through timely, rapid, and fair compensation, as well as policies that promote social support.

#### Implications for Public Health Planning and Research

The literature highlights an urgent need for proactive policies to evaluate and treat the short-term impacts on paid and volunteer clean-up workers and the general population, as well as the commitment of long-term funding to monitor and manage long-term impacts as they unfold.

# What have large marine spills taught us about effects on human health?



- **Short-term effects**
  - Headache, nausea, respiratory effects
  - Reversible, lasting days to months depending on duration of exposure
- **Long-term**
  - Respiratory, endocrinology, immunological
  - Sub-clinical effects, significance to long-term health unknown.
- **Mental Health & Community disruption**
  - Income loss (or rapid gain), health concerns, litigation
  - Individuals → Anxiety, PTSD (individuals)
  - Community disturbance → addiction, domestic violence, social cohesion



# Clean-up-related ill health effects



- Differential risk depending if you are:
  - Professional paid clean-up worker
  - Volunteers with variable training/PPE
  - Wildlife handlers
  - People who just show up

# Who is most at risk?



- Children
  - *Deepwater Horizon, Hebei Spirit*
- Natural resource-based communities → fishing, etc.
- Indigenous communities
  - Traditional foods; natural resource focus
  - Holistic views on health and the environment
  - Disproportionately impacted in past spills.

# Recent Spills in Canada

Date	Location	Type	Quantity
April 2005	Wabamun Lake, AB	Derailment	1,300,000 L bunker fuel oil
July 2007	Burnaby, BC	Pipeline	250,000 L crude oil
April 2011	Little Buffalo, AB	Pipeline	4,500,000 L crude oil
June 2012	Red Deer River, AB	Pipeline	500,000 L sour crude
July 2013	Lac-Mégantic, QC	Derailment	100,000 L crude + fatalities
July 2015	Vancouver, BC	Marine	2,800 L Bunker C fuel oil
July 2016	North Battleford, SK	Pipeline	225,000 L heavy crude
Oct. 2016	Bella Bella, BC	Marine	130,000 L diesel (+ other)





# Sinking of the Nathan E. Stewart

*Booms scattered over critical harvest area compromised by the spill*





# **October 13th, 1:00 a.m.:**

## **Sinking of the Nathan E. Stewart**

- Tug crashed into a reef and lost its barge in Gale Creek, Seaforth Channel
- 237,262 liters marine diesel and hydraulic oil dispersed
- Seaforth Channel is traditional and commercial harvesting bread basket
- Weeks before clam fishery opening

# Heiltsuk were first responders

- Heiltsuk boats, responders, witnesses at incident site
- No oil spill equipment
- No oil spill training



*Local responders using small skiffs to prevent the barge from running further up on the rocks.*



*Absorbent materials and booms used in initial attempt to contain the spill.*



# **Heiltsuk accommodated and fed over 200 people in Bella Bella for 6 weeks**

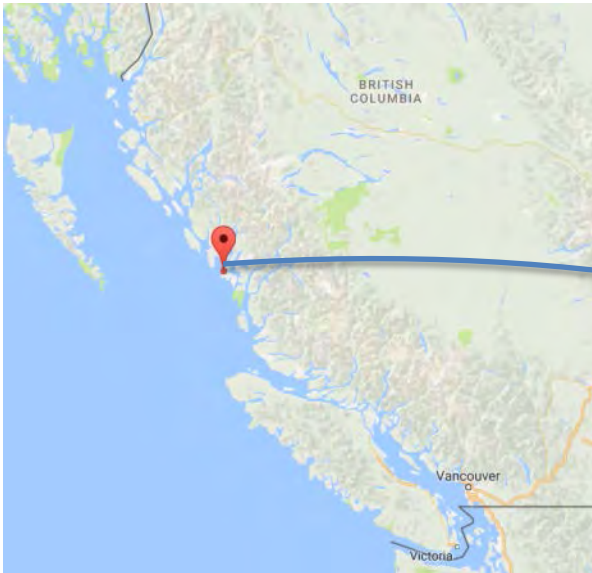
- Kirby Corporation, Governmental bodies, spill response crews, and environmental consultants
- Unified Command in Band Office
- Heiltsuk boats and crew support
- Heiltsuk environmental expert support
- Heiltsuk administrative support



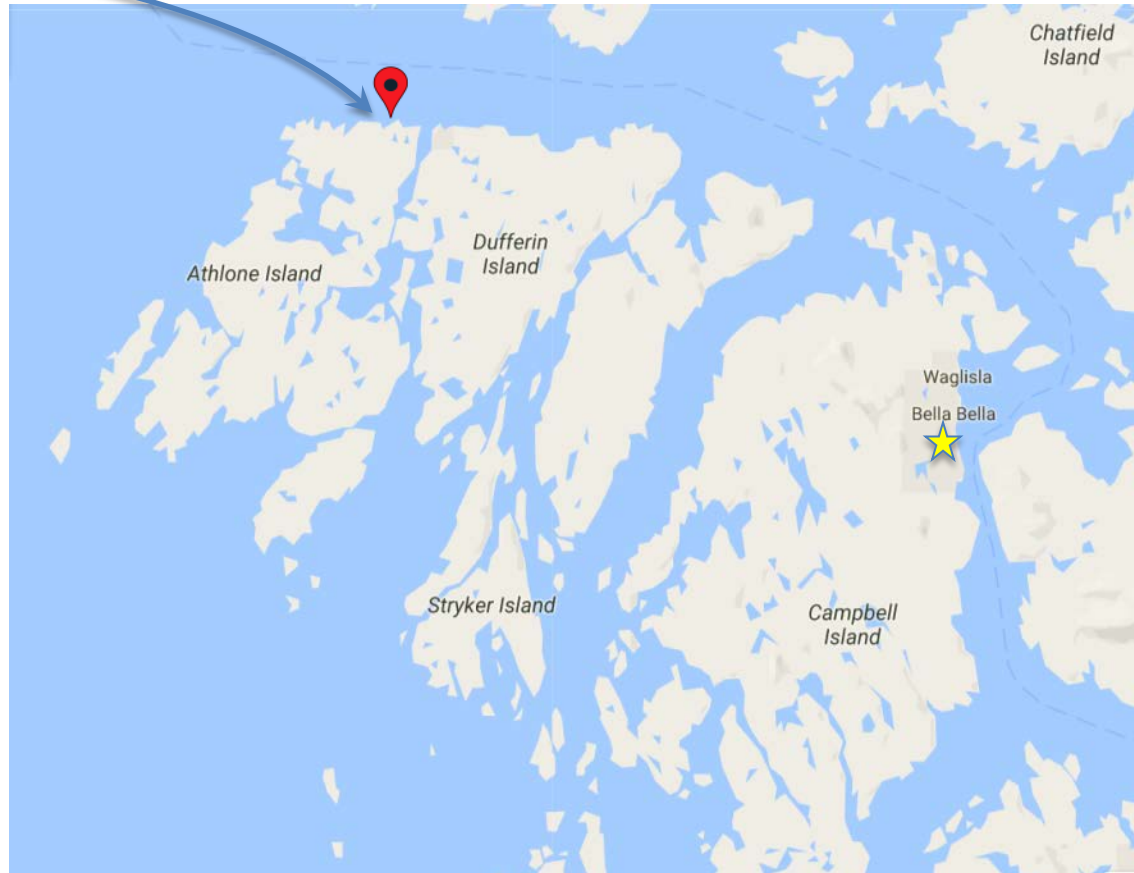
# Health impacts on Heiltsuk community

- Mental and physical impacts including oil exposure, shock, and exhaustion
- Fear of food safety
- Lost current and future harvesting
- Anger, alienation, and discrimination
- Immediate and long term health needs not recognized

# Remote Community, Rocky Coast



- 1,600 residents
- Within the Great Bear Rainforest
- Air or water access only
- Intricate coastline of channels and inlets



*Image credit: Google Maps 2016*

# Immediate Happenings

- The very first responders were local residents
- Remote location
- Minimal onsite coordination
- Protection of key harvest areas



*Image credit: FNHA*



*Image credit: Heiltsuk Nation*



# Environmental Public Health Response

- First Nations Health Authority
- Vancouver Coastal Health
- PREOC Coordination Calls
  - Nation representative on Unified Command
  - Appropriate responders appeared to be on-scene
  - Situational awareness, remote presence
- Day 3 notification by Hospital Manager and Community Health Nurse
- Local responders – no PPE, *exposure to vapor and/or dermal contact with diesel*
- Follow-up with Unified Command

# Immediate Public Health Actions

- Guidance for Volunteer Crews
- Onsite presence – Manager and 2 EHOs
- Verify onsite safety plan with Safety Officer
- Diesel and Health FAQ
- Clinic/hospital avoidance
- Rapid health assessment

# Rapid Health Assessment



- **Several objectives:**

- To assess physical impacts and encourage those experiencing symptoms to seek medical attention
- To broadly and basically assess whether mental health impacts were being felt to a greater or lesser degree.
- To provide community members with a “snapshot” or documentation of their status immediately post-spill.

- **Development and Deployment:**

- At the request of the Heiltsuk Council, with VCH + BCCDC
- Information sharing agreement put in place
- Administered by EHOs, medical review by VCH MHO
- Time to develop (5 days), deployed Day 8



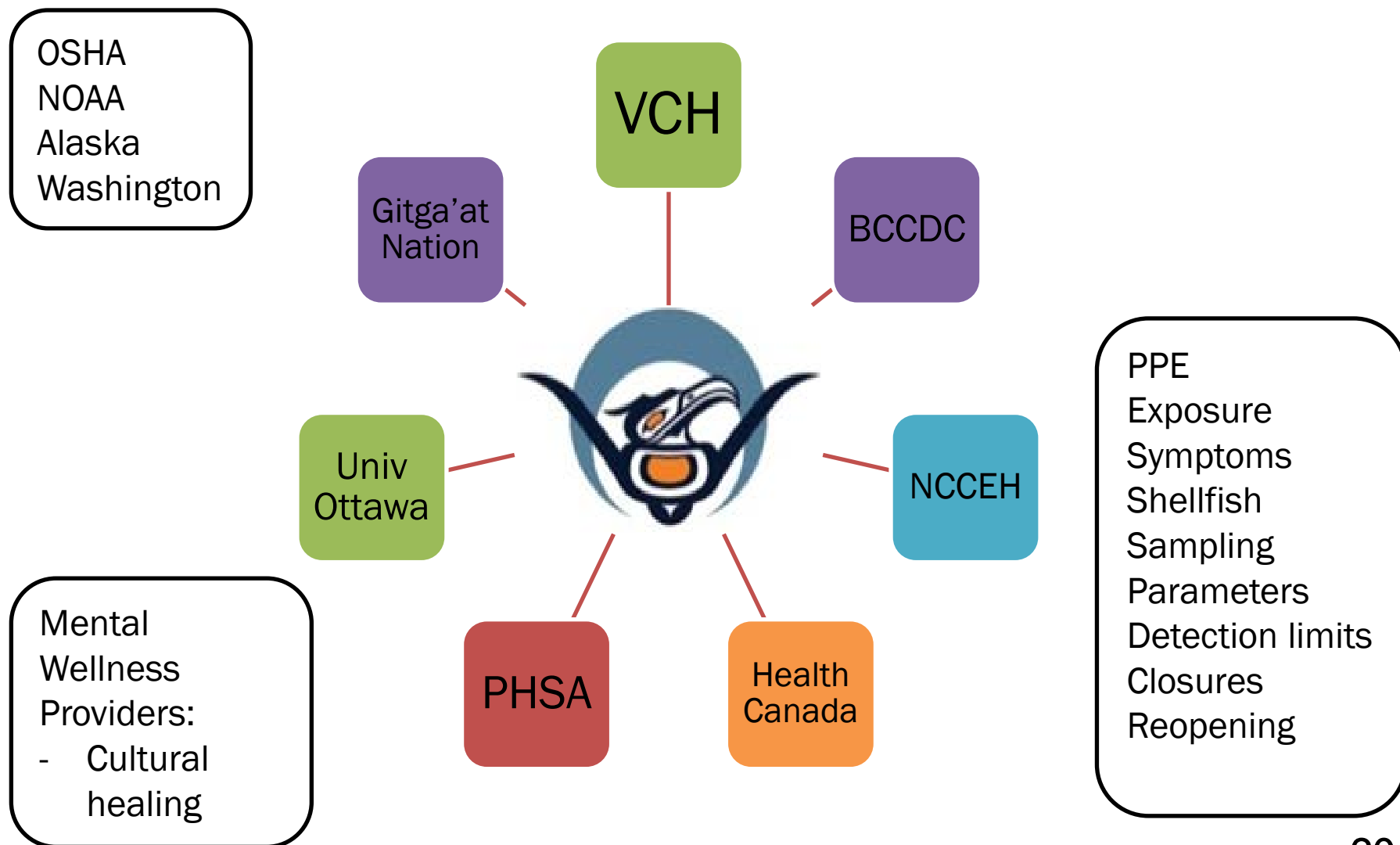
# What did the Rapid Health Assessment find?

- Assessment still in progress
- Local responders identified
- Benefits:
  - Recognizes individual experience, value of health
  - Identify concerning exposures/symptoms
  - Helped to identify all responders
  - Better understand on-site situation
- Challenges:
  - Access to responders during response phase
  - Deployed on Day 8 - late for triage in the event of severe physical impacts, *pre-prepared survey and tools are essential*
  - Available interviewers – capacity in small communities
  - Contaminated clothing inside homes - secondary exposure?

# Supporting Community Health

- Environmental Unit/Science Table
  - Traditional food concerns – safety, tainting, key species, health of the resources, FSC, commercial, recreational
  - Seafood Safety FAQ
  - Sampling plan review
  - *Traditional knowledge is essential*
- FNHA Regional Mental Wellness Advisor
- PHSA Disaster Psychosocial Services (DPS)
  - Emotional distress
- Cultural Service Providers
  - *Ensure cultural activities continue, support healing*

# Reaching out.... No single resource!



# Known Unknowns and Upcoming Challenges

*Human health = health of the environment*

- Fisheries closure
- When will the marine resources be safe?  
*Toxicological approach not sufficient*
- Are marine resources damaged?  
*Ecological impact and sustainability*
- What support will the community receive?  
*immediate, long term*
- How will community impacts be assessed?
- Role clarity – FNHA and other agencies

# Special Considerations for First Nations Communities

- How are First Nations communities differentially impacted?
- What aspects of the response may require reconsideration?
- What can we learn from First Nations communities?



# Next Steps....

- Epidemiological review of rapid health assessment questionnaires
- Advocating for Health Impact Assessment integrated with EIA/HHRA
  - Ensure impacts to people are clearly understood
  - Potential impacts beyond toxicology
  - Establish monitoring and surveillance early on
  - Mitigate further impacts

# Next Time: Crude Oil Guidance Document

- Chemical Emergency Preparedness and Response Unit (CEPRU)
- Series of guidance docs on risk characterization and management of PH risks from chemical spills
  - Cl, NH<sub>4</sub>, HF, **crude oil**
- **Feb. 23<sup>rd</sup>, 12 pm PST**





# CRUDE OIL: A Guide Intended for Public Health and Emergency Management Practitioners

- Aimed at PH practitioners involved in chemical emergency management
- Q&A style: covers prevention, planning and preparedness, responses and recovery
- Looking for **reviewers** and **collaborators** on NEW documents
  - H<sub>2</sub>S, HCN, phosgene, organophosphates, military warfare agents and chemicals of greatest potential for mass exposure silent releases such as a toxic metal.

Please contact CEPRU: [marc.lafontaine@canada.ca](mailto:marc.lafontaine@canada.ca)

# References

- Eykelbosh, A. J. 2014. Health Effects of Oil Spills and Implications for Public Health Planning and Research Vancouver, British Columbia:National Collaborating Centre for Environmental Health (NCCEH). Available at: <http://www.ncceh.ca/documents/evidence-review/health-effects-oil-spills-and-implications-public-health-planning-and>.
- Eykelbosh, A. J. 2014. Short- and long-term health impacts of marine and terrestrial oil spills. Vancouver, British Columbia. Available at: <https://www.vch.ca/media/VCH-health-impacts-oil-spill.pdf>.