



ENBRIDGE NORTHERN GATEWAY PIPELINE PROJECT

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PIPELINE



- Usually transport oil and raw natural gas
- With related equipment (pump stations)
- Pump station (pumps keep oil and gas flowing through pipelines)



BACKGROUND

- Alberta --the largest producer of oil and gas in Canada
- Problem: the surrounding countries (such as US) are becoming less dependent on imported energy sources
- Solution: find the new export markets
- Enbridge northern gateway pipeline project can solve the problem (open Asia markets)



ENBRIDGE NORTHERN GATEWAY PIPELINE

- Enbridge Company
- Proposal
- Twin pipeline
- 1,177 km each
- Bruderheim, AB, to Kitimat, BC
 - 520 km run in AB
 - 657km run in BC
- West bound pipeline
 - AB to BC
 - 36 inches diameter
- East bound pipeline
 - BC to AB
 - 20 inches diameter





*** This map is for illustrative purposes only and is not intended to be an official representation of territorial boundaries. ***
 Data: Pipeline; WorleyParsons; Tanker routes: Digitized by Living Oceans Society from Enbridge's regulatory application; Tar sands: Digitized by Global Forest Watch Canada from: Canadian Centre for Energy Information. Canada's Oil Sands, 2008; Yinka Dene Alliance: digitized by Living Oceans Society based on a Dogwood Initiative map



WEST BOUND PIPELINE

- Transport diluted bitumen, crude oil and other petroleum products
- Bitumen
 - viscous (thick and sticky)
 - not flow easily through pipelines
- Diluted bitumen (blend with condensate and bitumen)
 - flow relative easily



EAST BOUND PIPELINE

- Transport condensate only
- Condensate
 - from natural gas production
 - limited supply of condensate in Western Canada
 - High demand for condensate in AB
 - Import condensate from Middle East and the Asia-Pacific region



NOT JUST PIPELINE

- In the Kitimat terminal
 - two tanker berth platform
 - Very Large Crude Carriers (for exporting oil to Asia market)
 - Suezmax-type condensate tankers (for importing condensate)



COSTS

- High construction and maintenance costs
- Impact on the ecosystem
- Impact on Aboriginal groups
- high risk of oil spill



HIGH CONSTRUCTION AND MAINTENANCE COSTS

- \$7.9 billion to build
 - pre-development costs and marine navigation enhancements
- 220 tankers would call annually
- Maintenance costs for 1,177 km long each pipeline

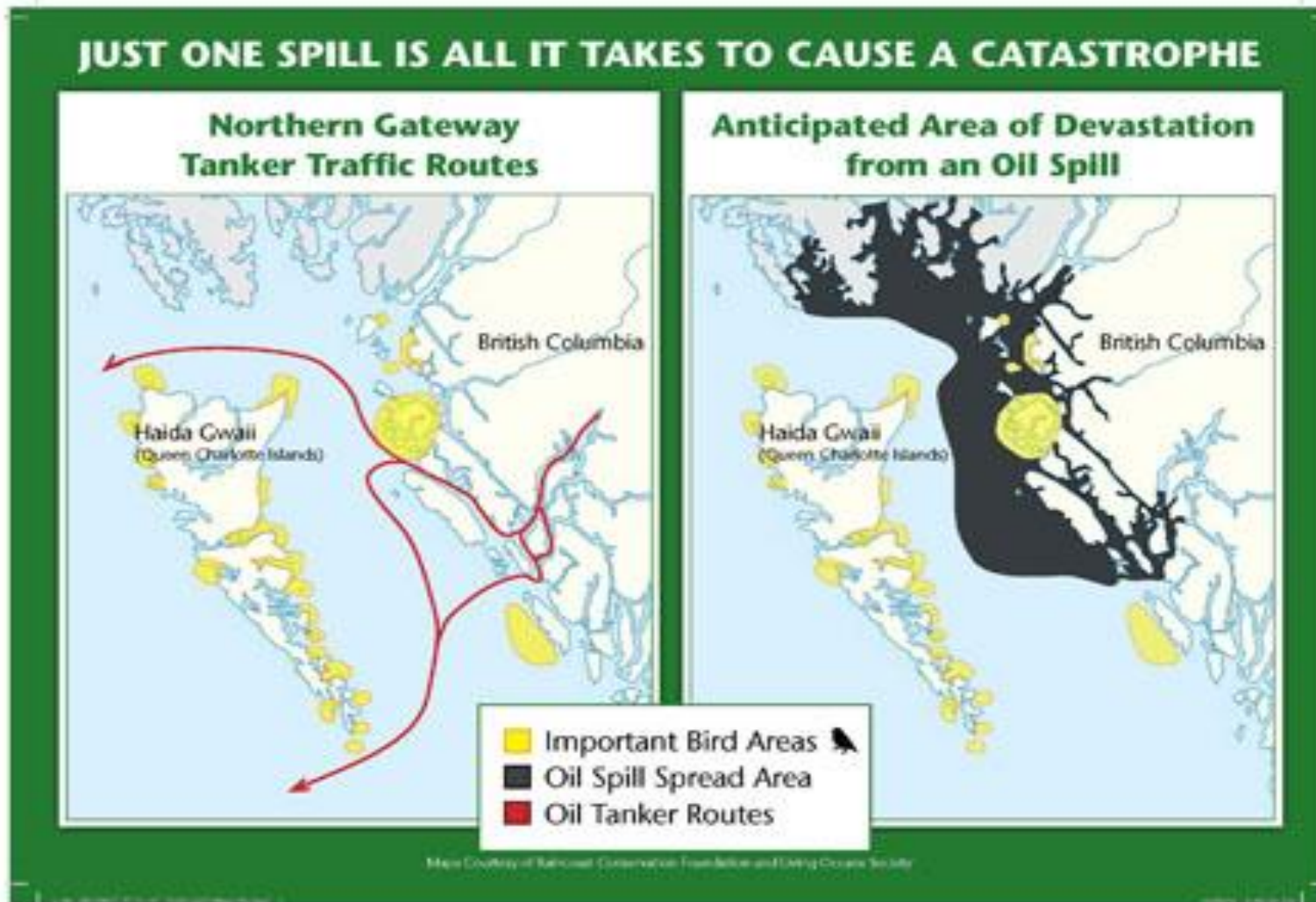


IMPACT ON THE ECOSYSTEM

- Route crosses the Northern Rockies of AB and the Coast Mountains of BC (also crosses about 800 streams and rivers)
 - remove trees
 - affect the habitat of animals and plants
 - pollute waters and soil
 - have devastating impacts on animals



IMPACT ON THE ECOSYSTEM



IMPACT ON ABORIGINAL GROUPS

- Route cross lands used by Aboriginal groups
- People may need to move
- Potentially cause health issues
- Impacts on fisherman



HIGH RISK OF OIL SPILL

Table 1. Total Spills on Enbridge Pipelines (Canada and U.S.), 1999 - 2010¹⁷¹

Year	Number of spills	Quantity of barrels spilled
1999	54	28,760
2000	48	7,513
2001	34	25,980
2002	48	14,683
2003	62	6,410
2004	69	3,252
2005	70	9,825
2006	68	5,734
2007	65	13,777
2008	92	2,842
2009	103	8,441
2010	91	34,258
Total	804	161,475 (Approximately 25.67 million litres, or 6.8 million gallons)



BENEFITS

- Carry large quantity transportation
- The convenience of transportation
- Lessen the tax burden on resident



CARRY LARGE QUANTITY TRANSPORTATION

- Carry 525 thousand barrels of oil per day(AB to BC)
- Carry 193 thousand barrels of condensate per day(BC to AB)
- Carry 2.1 million barrels of oil each time(VLCC)
- Carry 1.17 million barrels of condensate each time(Suezmax)



THE CONVENIENCE OF TRANSPORTATION

- Not affected by weather
- The operation of the pipeline could happen anytime



LESSEN THE TAX BURDEN ON RESIDENTS

- Generate \$1.2 million in tax revenues for the province over the next 30 year
- Improve the living standard of residents



SOLUTIONS FOR THE PROJECT

- At least, 20% thicker than required(steel)
 - required standard is 16.9mm
- X-ray or ultrasonic testing of all welds
- Require a team of experts to monitor the safety of its operations
- Build double hulls into the vessels of the oil tankers
- Reduce possibility of human error (when operating tanker)



BARRIERS TO THE SOLUTIONS

- Enbridge company
- Increase the total costs(\$)
- Lower willingness to carry out the solutions



RECOMMENDATION

- Change the route (avoid crossing rivers and water streams)
- Use thicker steel and build double hulls into the vessels of the oil tankers
- Work together with the provincial and local governments to improve its project



THANK YOU

