

Hazard assessment of the

Eagle Mountain to Woodfibre Gas Pipeline Project
proposed by FortisBC

December 2020



MY SEA TO SKY

This hazard assessment of the *Eagle Mountain to Woodfibre Gas Pipeline Project* currently proposed by FortisBC was completed using ALOHA.

ALOHA (Areal Locations of Hazardous Atmospheres) is a computer program developed jointly by the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA) to model fires and explosions for emergency responders and planners.

The program models many release scenarios, including: fires and explosions, toxic gas clouds, BLEVEs (Boiling Liquid Expanding Vapor Explosions), jet fires, vapor cloud explosions, and pool fires.

Data inputted into the program was taken from publicly available sources such as submissions by FortisBC to the BC Utilities Commission, the BC Oil and Gas Commission, and the BC Environmental Assessment Office.

As with all of these exercises, there is no exact number given the great number of variables. However, this analysis can be used to get an approximation of hazardous areas for first responders that are responding to a worst-case scenario accident.

The following maps show pressure waves and radiative effects from a worst-case scenario accident for the *Eagle Mountain to Woodfibre Gas Pipeline Project* in the Squamish Business Park, Finch Drive, and Ravens Plateau neighbourhoods in Squamish; and the Westwood Plateau neighbourhood in Coquitlam.

Pressure waves are the blast force from an explosion. **Radiative effects** is the radiation from a fire.

Baseline numbers used in the analysis:

Pressure: 2127 psig

Pipeline size: 24 inch

Pipeline type: smooth pipe

Pipeline contents: methane gas

Source of ignition: detonation

Open pipe after explosion (common to this type of failure)

3.7 kilometres of pipeline to feed fire/vapour plume (rough distance between shut-off valves). This is extremely conservative and expects every safety to work perfectly. In the event that it does not, the impact of pressure waves and radiative effects get much worse.

Topography: somewhat dense (not open fields)

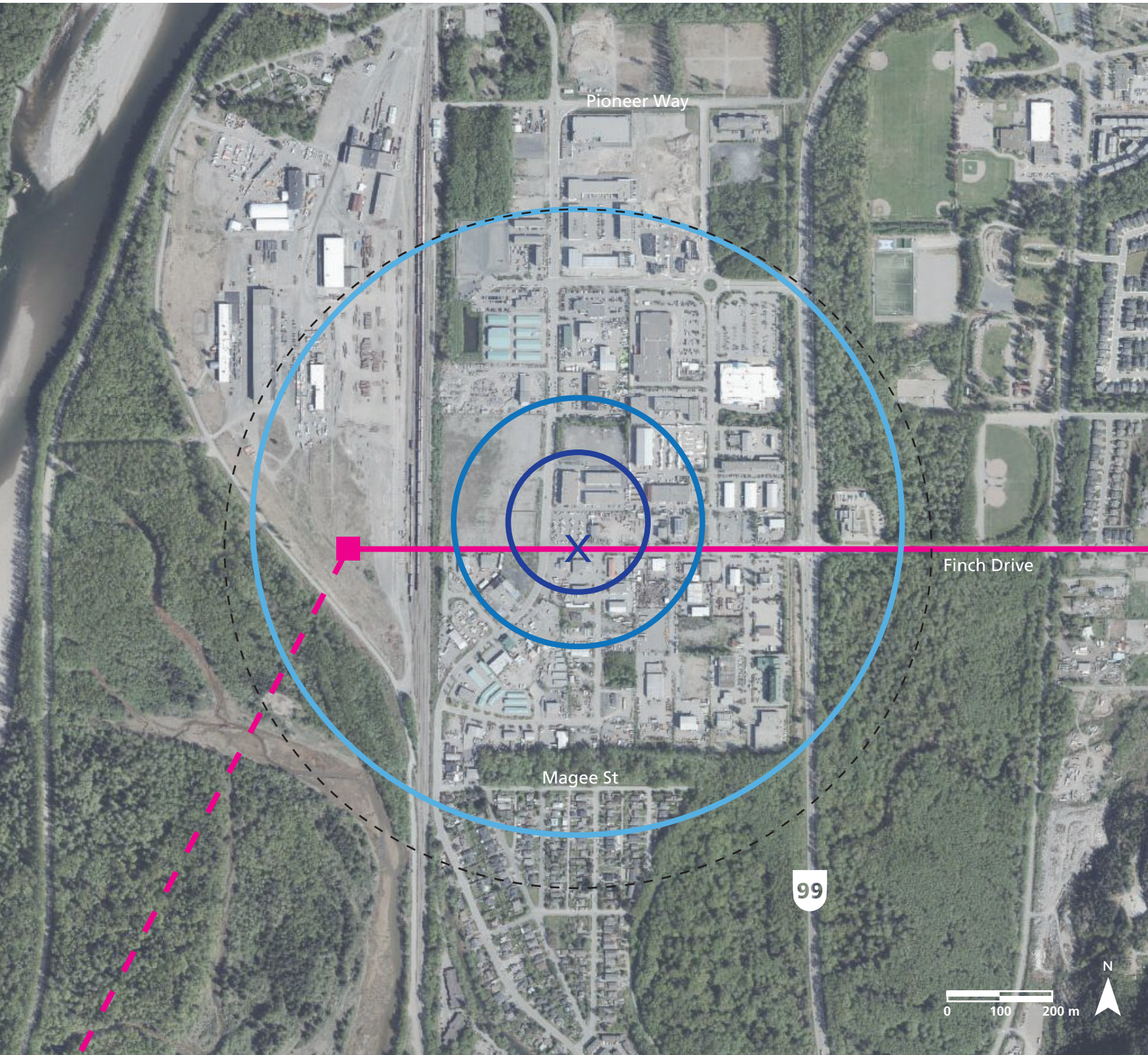
Buildings: two story dwellings

Weather: Cloudy

Temperature: 8 degrees Celsius

Wind speed: 5 m/s

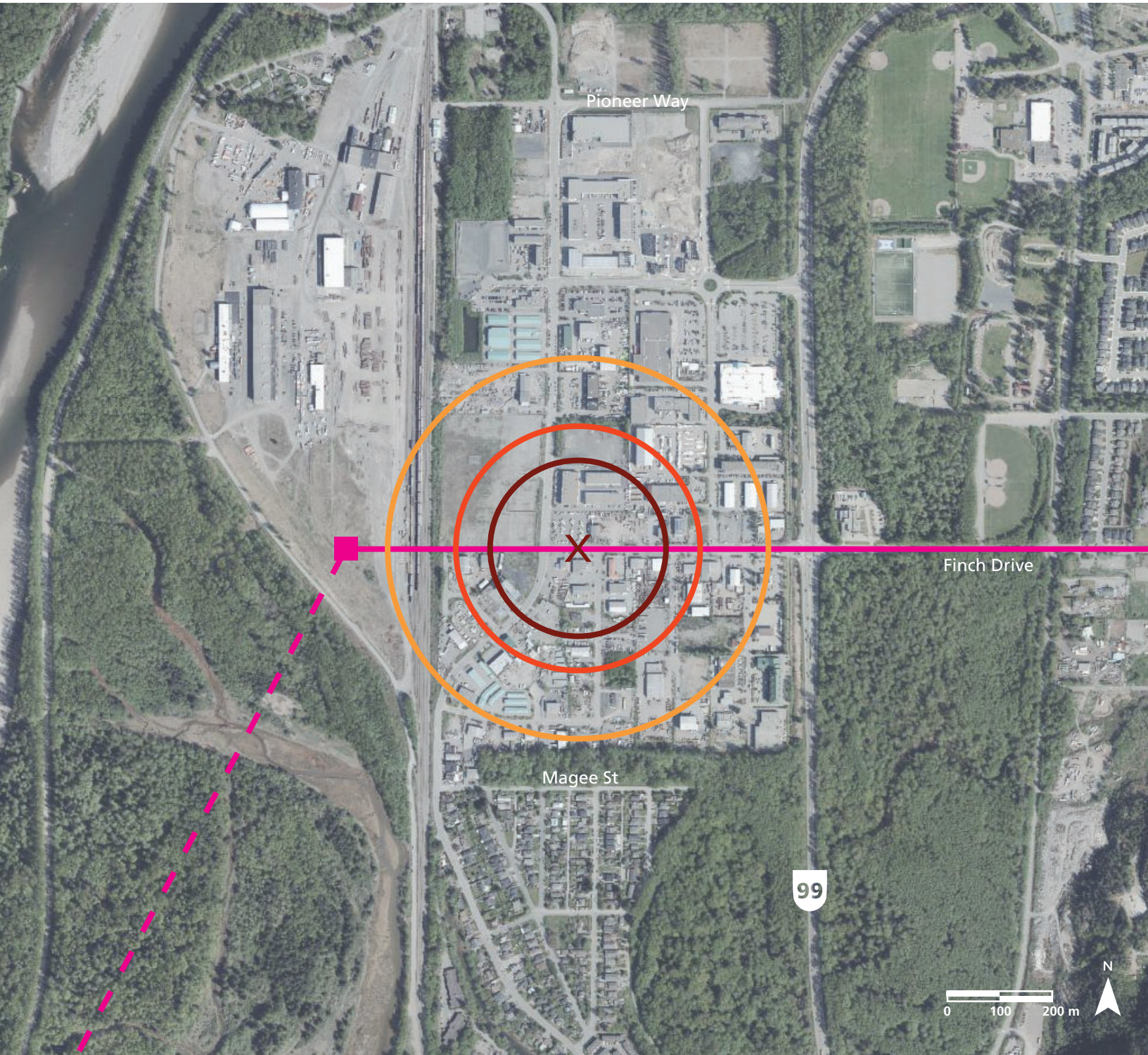
Pressure waves from a worst-case scenario accident
of the proposed FortisBC 24-inch high pressure pipeline
in the Squamish Industrial Park



Pressure waves

- Destruction of buildings up to 360 metres (> 8.0 psi)
- Serious injury likely up to 570 metres (> 3.5 psi)
- Shatters glass up to 1,275 metres (> 1.0 psi)
- Wind direction confidence lines (5 m/s)
- FortisBC 24-inch pipeline
- Approximate start of underground tunnel to Woodfibre site.
- Worst-case scenario accident

Radiative effects from a worst-case scenario accident
of the proposed FortisBC 24-inch high pressure pipeline
in the Squamish Industrial Park

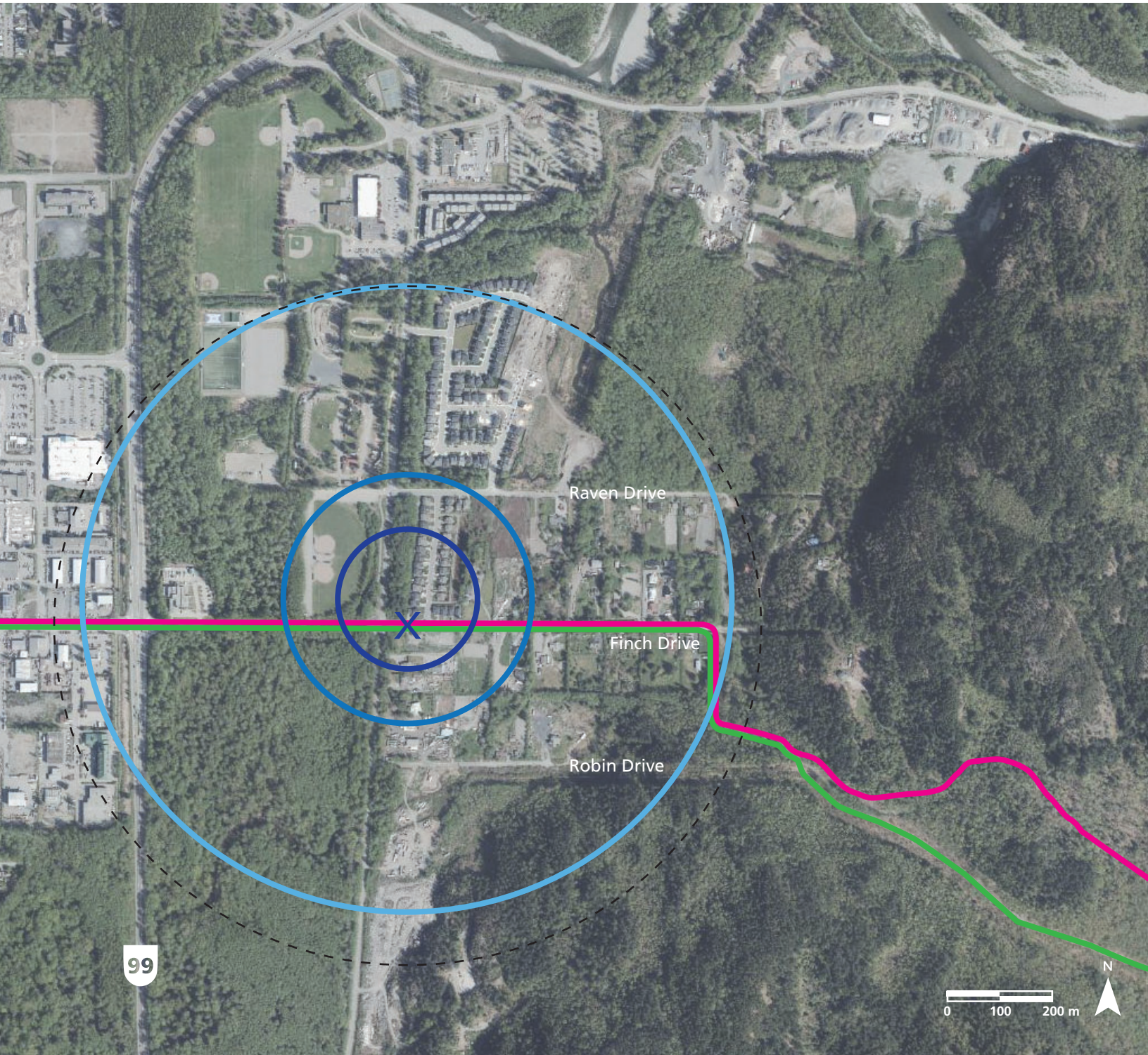


Radiative effects within 60 seconds

- Potentially lethal within 330 metres ($> 10 \text{ kW per m}^2$)
- Second degree burns within 460 metres ($> 5 \text{ kW per m}^2$)
- Pain within 715 metres ($> 2 \text{ kW per m}^2$)
- FortisBC 24-inch pipeline
- Approximate start of underground tunnel to Woodfibre site.
- X

 Worst-case scenario accident

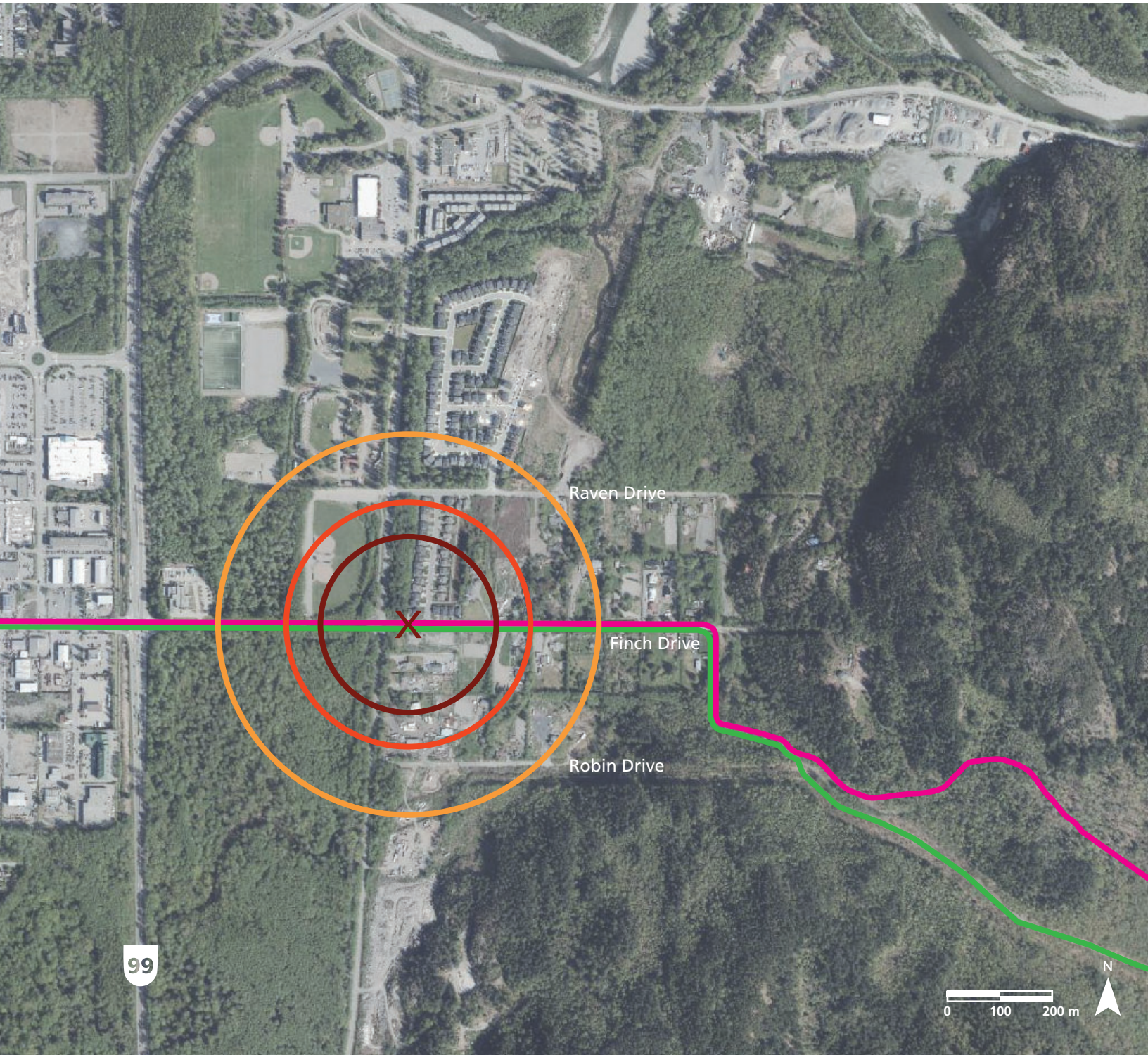
Pressure waves from a worst-case scenario accident
of the proposed FortisBC 24-inch high pressure pipeline
on Finch Drive, Squamish









Pressure waves

- Destruction of buildings up to 360 metres (> 8.0 psi)
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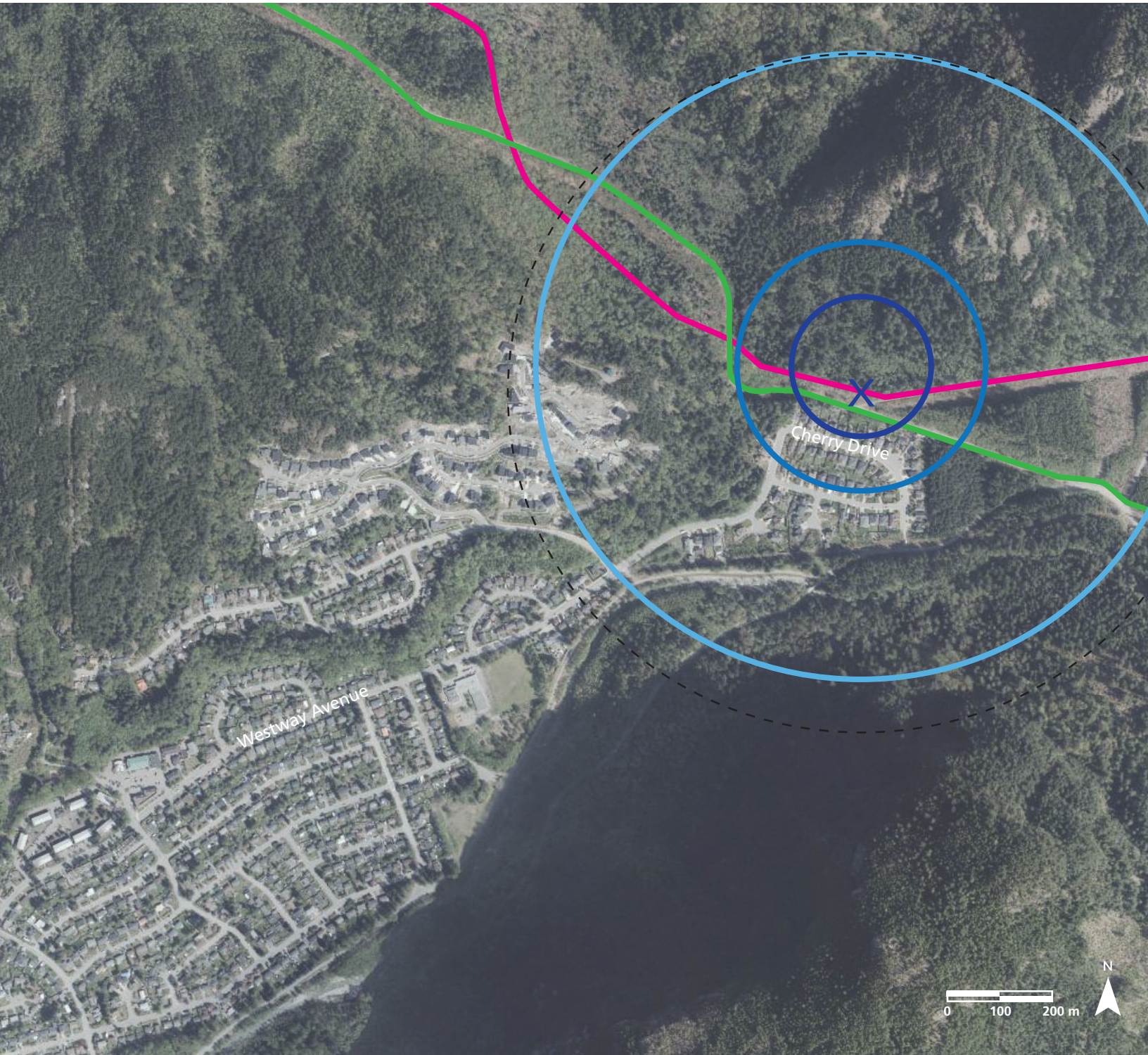
Radiative effects from a worst-case scenario accident
of the proposed FortisBC 24-inch high pressure pipeline
on Finch Drive, Squamish










Radiative effects within 60 seconds

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|---|--|
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|  Pain within 715 metres ($> 2 \text{ kW per m}^2$) |  Worst-case scenario accident |

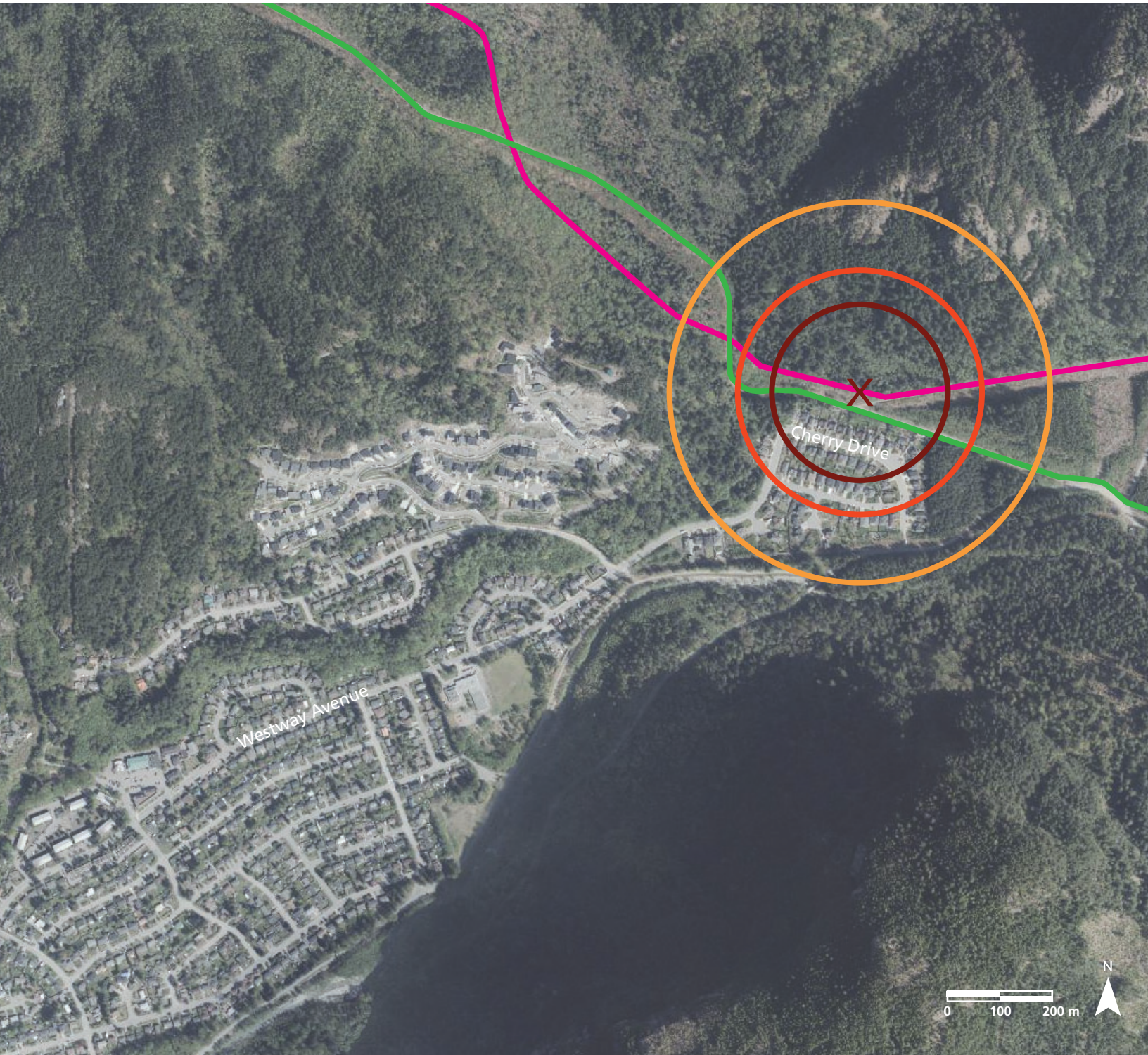
Pressure waves from a worst-case scenario accident
of the proposed FortisBC 24-inch high pressure pipeline
in Valleycliffe, Squamish









Pressure waves

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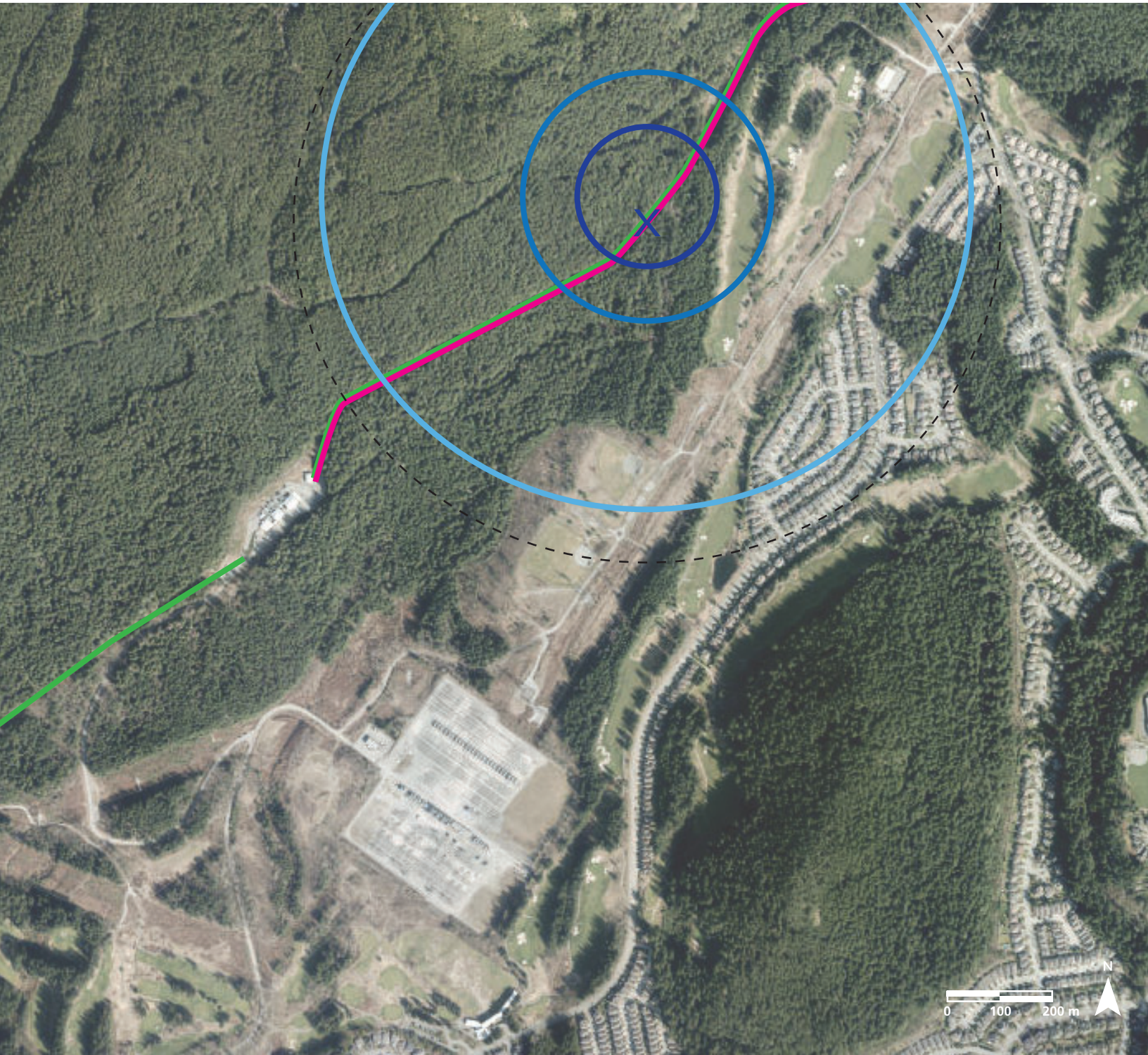
Radiative effects from a worst-case scenario accident
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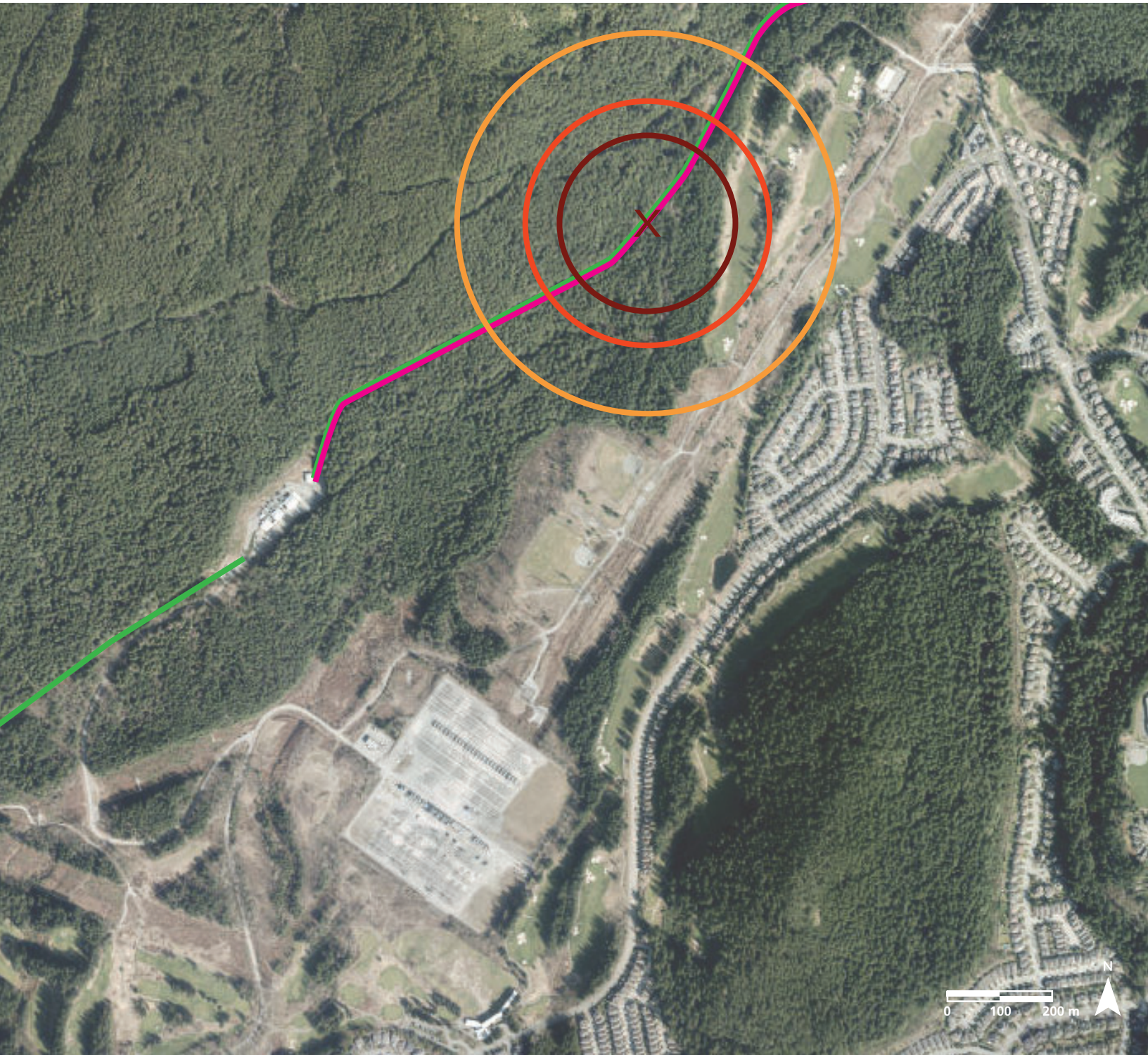
Pressure waves from a worst-case scenario accident
of the proposed FortisBC 24-inch high pressure pipeline
near Westwood Plateau, Coquitlam









Pressure waves

- | | |
|---|--|
|  Destruction of buildings up to 360 metres (> 8.0 psi) |  FortisBC 24-inch pipeline |
|  Serious injury likely up to 570 metres (> 3.5 psi) |  Existing 12-inch pipeline |
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|  Wind direction confidence lines (5 m/s) | |

Radiative effects from a worst-case scenario accident
of the proposed FortisBC 24-inch high pressure pipeline
near Westwood Plateau, Coquitlam



Radiative effects within 60 seconds

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