



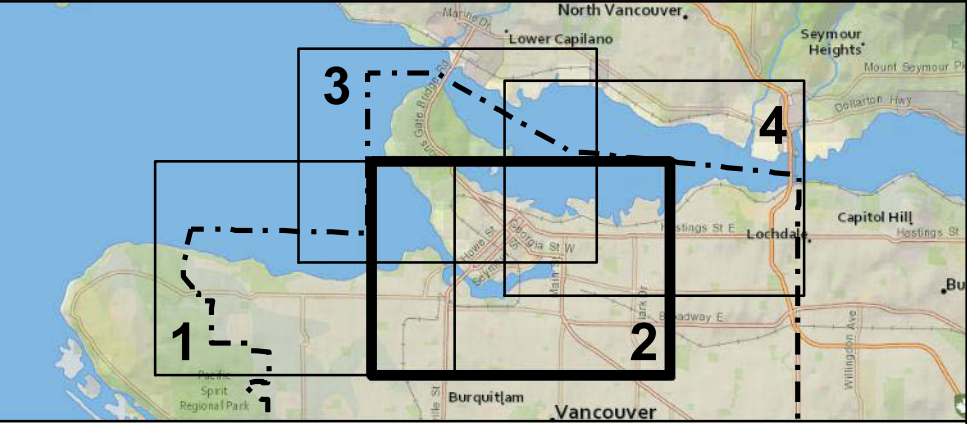
SCENARIO 3
modelled water level with 0.6 m freeboard = 4.6 m GD

NOTE: Flooding may affect infrastructure that is located below elevated structures. Depths and extent of flooding in these areas are not represented.

- Flood Extents
- Flood Extents Including Freeboard
- Ocean (not modelled)
- Wave Effect Boundary
Wave effects should be considered seaward of this boundary.
- Model Zone Boundary
- Indian Reserve Boundary
- City Boundary
- Port Boundary (approximate)
- Future Building Footprints (2041)



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- Notes:**
- Flood water levels were developed for five coastal flood scenarios as described in NHC et al. (2014). This map delineates the potential for coastal flooding under Year 2100 conditions assuming a 1.0 m sea level rise (SLR) and a current 500-year return period ocean event. A 500-year return period ocean event means that, on average, the event will occur once in 500 years and that there is a one-in-500 chance that the flood level mapped could be equalled or exceeded in any one year (or that there is about a one-in-10 chance that the flood level mapped could be equalled or exceeded in a period of 50 years).
 - The adopted value for SLR is based on guidelines from Ausenco-Sandwell (2011), and discussions and recommendations from the project's Technical Advisory Group.
 - A freeboard allowance (safety factor) of 0.6 m is included in the flood levels shown to account for various sources of uncertainty in the model inputs and parameters.
 - The flood levels are based on water surface profiles simulated using a two-dimensional hydrodynamic model developed by NHC (NHC et al., 2014). A generalization algorithm was used to merge closely spaced buildings (<5m apart) that would act as a single obstacle to the flow. Buildings were removed from the model mesh and building outlines represented by solid boundaries. Model roughness values were assigned based on typical land use classes to represent the flow resistance due to various energy losses.
 - LIDAR data surveyed in 2013 was used to create a Digital Elevation Model (DEM) for the City of Vancouver; the DEM surface was edited to remove buildings and temporary features. The DEM surface was also modified to include (1) the Powell Street Overpass, currently under construction, (2) modifications to Pacific Boulevard and Griffiths Way planned as part of the Georgia Viaduct removal, (3) underpasses at the Stanley Park Causeway east of Lost Lagoon, and (4) manually interpolated bathymetry under some pile structures in the Inner Harbour. The maps depict flood levels based on ground conditions represented in this DEM. Any changes to ground elevations, land use or buildings from those included in the model will affect the flood levels and render site-specific information obsolete.
 - The model geometry was kept constant at all flows although variations (erosion, subsidence, or future constructions) may occur before and during a flood. Irregularities or blockages caused by fences, walls, hedges, vehicles, boats, or other barriers are difficult to characterize and were not represented in the model. The flood map does not take into account flood defences which may be in place now or in the future.
 - The accuracy of simulated flood levels is limited by the reliability of the water level data used for calibrating the model. Only limited calibration data was available at select locations and in no instance extended more than 15 m from the shoreline.
 - The accuracy of the location of a floodplain boundary is limited by the accuracy of the DEM, model boundary conditions and model parameters.
 - Waves were modelled based on a primary wave and wind direction of 295 degrees for Point Grey, Kits Point and False Creek, 275 degrees for English Bay and the west shore of Stanley Park, and both 65 and 310 degrees for the east shore of Stanley Park and the Inner Harbour. Waves caused by other sources, such as boat traffic, tsunamis or landslides, were not considered in the model. Buildings were included in the wave model and have a sheltering effect; if a building is removed, the wave effect may be increased. Wave effects were generalized for representation on the maps; apply to the seaward side of the wave effect boundary; and, are only shown for Scenario 3. Where a wave effect boundary crosses a building, the entire building is considered to be within the wave effect area. Wave effects need to be accounted for either by adding 0.3 m to the FCL, or by conducting a local wave effect study.
 - Other sources of water (i.e. precipitation, groundwater, or sewer surcharge) and complex interactions between subsurface drainage networks and structures (i.e. Skytrain infrastructure, underground parking, conduits, etc.) were not considered and can affect flood levels locally. A Qualified Professional must be consulted for site-specific engineering analysis.
 - Industry best practices were followed to generate the flood extent maps. However, actual flood levels and extents may vary from those shown and Northwest Hydraulic Consultants Ltd. (NHC) does not assume any liability for such variations.

Data Sources:

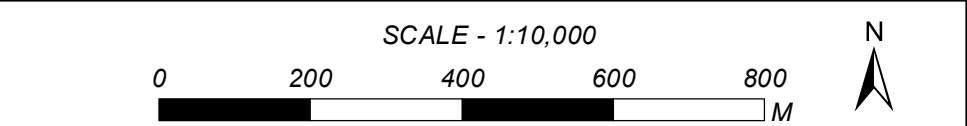
- Building footprints supplied by City of Vancouver.
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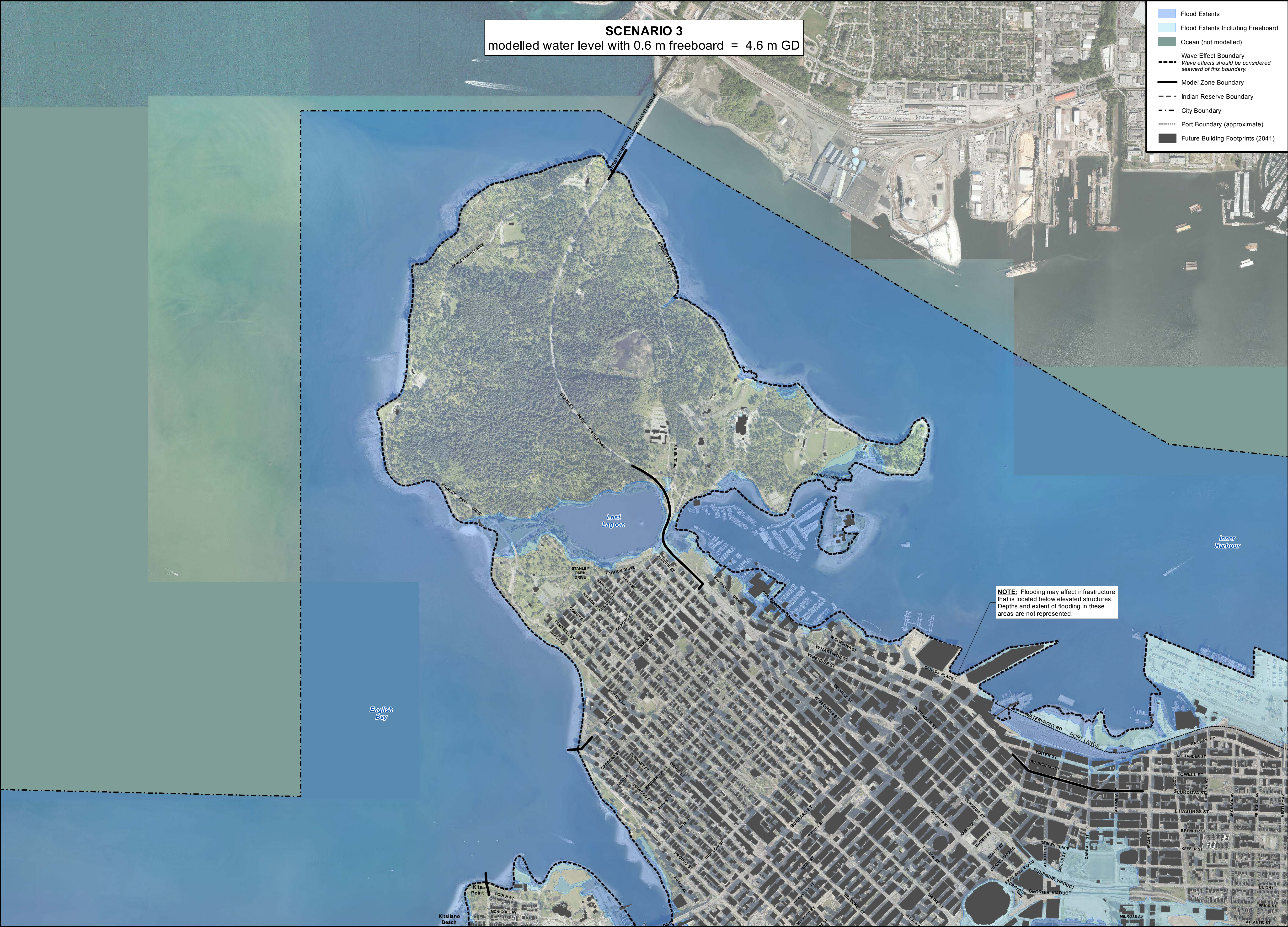


Coordinate System: NAD 1983 UTM ZONE 10N		Date	
Units: METRES		18-JUN-2014	
Engineer	GIS	Reviewer	Job Number
VFOC	MSN	MM	300227

**COASTAL FLOOD RISK ASSESSMENT
BURRARD INLET FLOOD EXTENTS
INCLUDING FREEBOARD**

**SCENARIO 3 - YEAR 2100, SLR 1 M
PROBABILITY OF 1/500**

MAP 2 OF 4



SCENARIO 3
modelled water level with 0.6 m freeboard = 4.6 m GD

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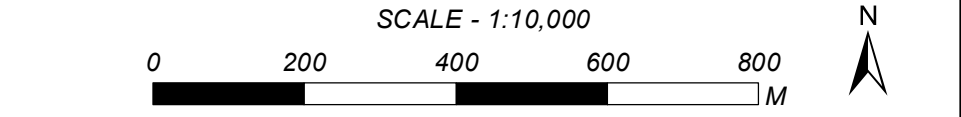


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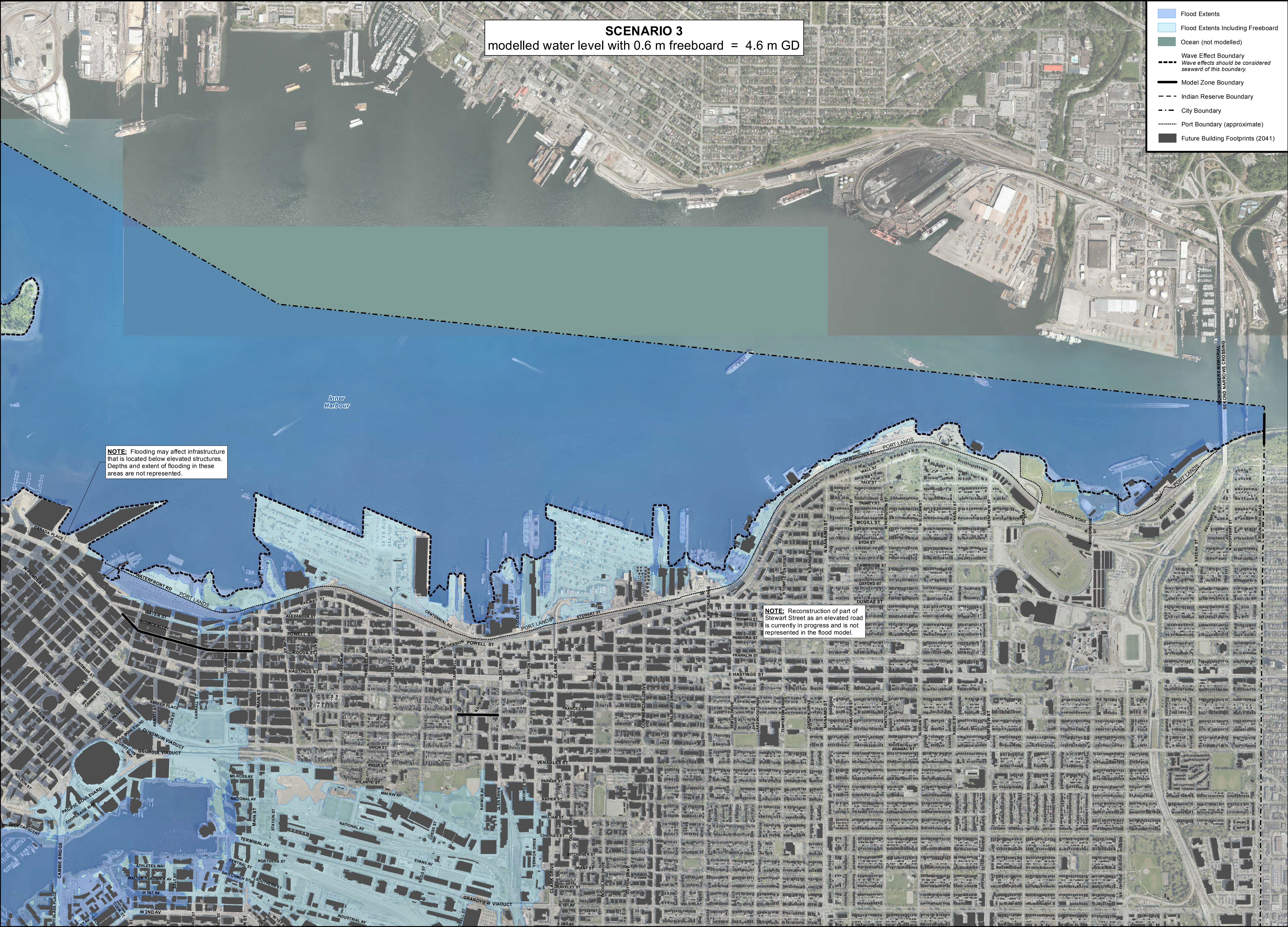


Coordinate System: NAD 1983 UTM ZONE 10N
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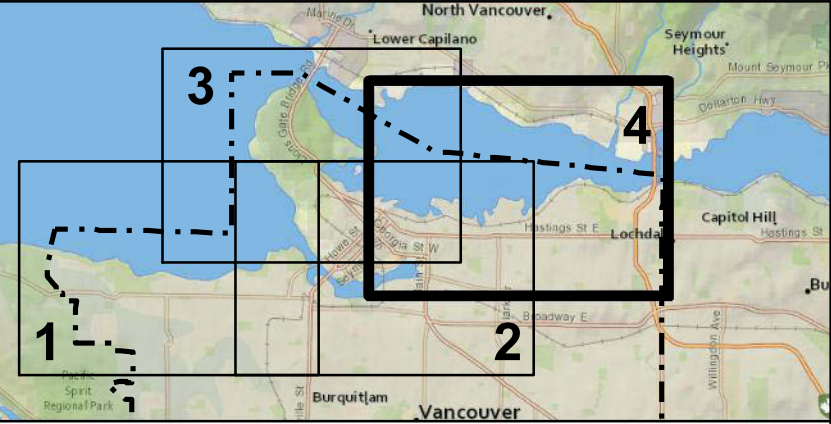
Engineer: VFOC
GIS: MSN
Reviewer: MM
Job Number: 300227

**COASTAL FLOOD RISK ASSESSMENT
BURRARD INLET FLOOD EXTENTS
INCLUDING FREEBOARD
SCENARIO 3 - YEAR 2100, SLR 1 M
PROBABILITY OF 1/500
MAP 3 OF 4**



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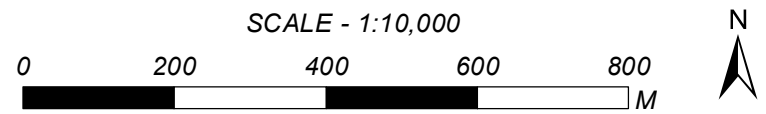


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