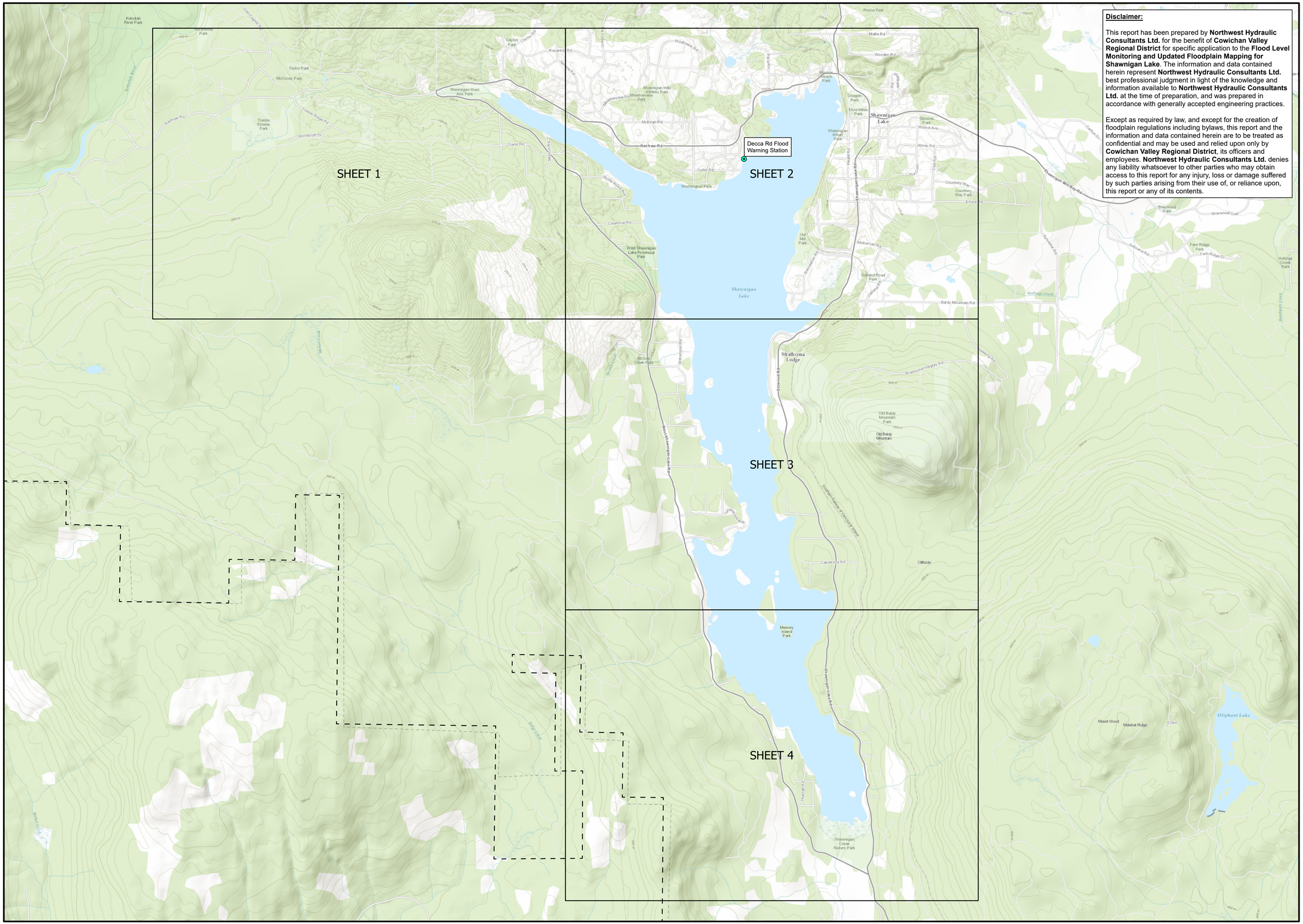

Disclaimer:

This report has been prepared by **Northwest Hydraulic Consultants Ltd.** for the benefit of **Cowichan Valley Regional District** for specific application to the **Flood Level Monitoring and Updated Floodplain Mapping for Shawnigan Lake**. The information and data contained herein represent **Northwest Hydraulic Consultants Ltd.** best professional judgment in light of the knowledge and information available to **Northwest Hydraulic Consultants Ltd.** at the time of preparation, and was prepared in accordance with generally accepted engineering practices.

Except as required by law, and except for the creation of floodplain regulations including bylaws, this report and the information and data contained herein are to be treated as confidential and may be used and relied upon only by **Cowichan Valley Regional District**, its officers and employees. **Northwest Hydraulic Consultants Ltd.** denies any liability whatsoever to other parties who may obtain access to this report for any injury, loss or damage suffered by such parties arising from their use of, or reliance upon, this report or any of its contents.

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MAPSHEET
CVRD BOUNDARY

General Notes:
1. The flood maps were prepared under the Cowichan Valley Regional District's "Shawnigan Lake Flood Preparedness Monitoring Project" by Northwest Hydraulic Consultants Ltd (NHC) in 2020. This study's final report should be consulted prior to use of the flood maps.
2. The maps delineate potential flooding caused by a designated flood event, having a 200-year return period event with a 20% climate change allowance.
3. The future climate change flows represent plausible conditions in the year 2100. However, the actual time frame for the changes is uncertain.
4. The Flood Construction Levels (FCL) include an allowance for freeboard and wave runup (Shawnigan Lake only).
5. All elevations are referenced to Canadian Geodetic Vertical Datum 2013 (CGVD2013).

Data Sources:
1. Floodplain topography is based on Lidar flown by Terra Remote on October 20th, 2010 and was provided to NHC by the CVRD.
2. Surveys of Shawnigan Creek were carried out in February 2020.
3. Municipal boundaries, cadastral information were provided by the CVRD and GeoBC.
4. The background orthophoto was flown in 2019 and was supplied by the CVRD.

Use and Limitations of Floodplain Maps:
1. Floodplain maps are an administrative tool that depict the potential flood extent and minimum recommended Flood Construction Levels for the adopted designated flood. A Qualified Professional must be consulted for a site-specific engineering analysis.
2. The maps depict the flooding conditions at the time of surveys. Future changes to the river channels, floodplain, and future climate change will render site-specific map information obsolete. The information on the maps should be assessed regularly (5 to 10 years) or after any extreme flood occurrence.
3. The floodplain limits have not been established on the ground by legal survey. The accuracy of the flood boundaries is limited by the Lidar base mapping and orthophotography.
4. The flood maps do not represent flooding from local stormwater runoff, ponding from rainwater on the floodplain, groundwater seepage or local drainage courses. Consequently, additional flooding may occur outside of the designated boundaries.
5. Roads, railways, bridges, new dikes and future developments on the floodplain can restrict water flow and increase local water levels. Obstructions such as debris jams and channel sedimentation can also increase flood levels above the levels shown on the maps.
6. The flood maps do not represent hazards due to erosion, avulsion or channel migration.
7. Industry best practices were followed to generate the flood maps. However, actual flood levels and extents may vary from those shown; Northwest Hydraulic Consultants Ltd. (NHC) and the Cowichan Valley Regional District do not assume any liability for such variations.

SCALE - 1:15,000
0 200 400 600 800 M
N

Coordinate System: NAD 1983 UTM Zone 10N
Units: Metres; Vertical Datum: CGVD2013

Engineer	GIS	Reviewer
KEK/NAV	BLH	DGM

Job Number	Date
3005433	14-OCT-2020

SHAWNIGAN LAKE FLOOD PREPAREDNESS MONITORING PROJECT

FLOODPLAIN MAPPING INDEX SHEET

SHEET 2 →

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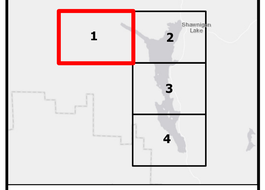

- FLOOD EXTENTS INCLUDING FREEBOARD
- FLOOD CONSTRUCTION LEVEL (FCL) INCLUDING FREEBOARD
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- BRIDGE
- RAIL
- PARCEL BOUNDARY
- REGIONAL DISTRICT BOUNDARY
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FLOODPLAIN MAP NOTES

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2. The map depicts flooding from a 200-year flood event, adjusted to account for a 20% increase in discharge due to future climate change.
3. The Designated Flood Level (DFL) on Shawnigan Lake is 119.24 m, (excluding freeboard or wave effects).
4. The Flood Construction Level (FCL) on Shawnigan Creek includes a freeboard allowance of 0.6 m.
5. The Flood Construction Level (FCL) on Shawnigan Lake includes a freeboard allowance of 0.3 m plus an additional allowance to account for wave runup. The magnitude of the runup varies depending on shoreline exposure and fetch length.
6. The horizontal extent of inundation shown on the maps includes the adopted freeboard and wave runup.
7. Local bulkheads, retaining walls, revetments and other structures constructed on the shoreline of the lake may amplify wave runup effects above the value depicted on these maps. Site specific analysis by a qualified professional is required to assess these hazards.

SCALE - 1:5,000

0 100 200 300 M

N

Coordinate System: NAD 1983 CSRS UTM Zone 10N
Units: Metres; Vertical Datum: CGVD2013

Engineer	GIS	Reviewer
KEK/NAV	BLH	DGM

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SHAWNIGAN LAKE FLOOD PREPAREDNESS MONITORING PROJECT

FLOODPLAIN MAP SHEET 1 OF 4

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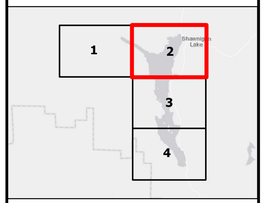

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SCALE - 1:5,000
0 100 200 300 M
N

Coordinate System: NAD 1983 CSRS UTM Zone 10N
Units: Metres; Vertical Datum: CGVD2013

Engineer	GIS	Reviewer
KEK/NAV	BLH	DGM

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SHAWNIGAN LAKE FLOOD PREPAREDNESS MONITORING PROJECT

FLOODPLAIN MAP SHEET 2 OF 4

SHEET 2 ↑

SHEET 4 ↓

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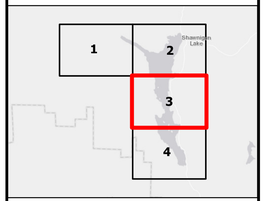

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0 100 200 300 M

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Coordinate System: NAD 1983 CSRS UTM Zone 10N
Units: Metres; Vertical Datum: CGVD2013

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SHAWNIGAN LAKE FLOOD PREPAREDNESS MONITORING PROJECT

FLOODPLAIN MAP SHEET 3 OF 4

SHEET 3 ↑

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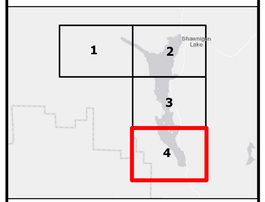

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SHAWNIGAN LAKE FLOOD PREPAREDNESS MONITORING PROJECT

FLOODPLAIN MAP SHEET 4 OF 4