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FORT VERMILION FLOOD HAZARD STUDY

ICE JAM FLOOD INUNDATION MAP LIBRARY



Prepared for:



31 March 2021

DISCLAIMER

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NHC Ref. No. 1006302



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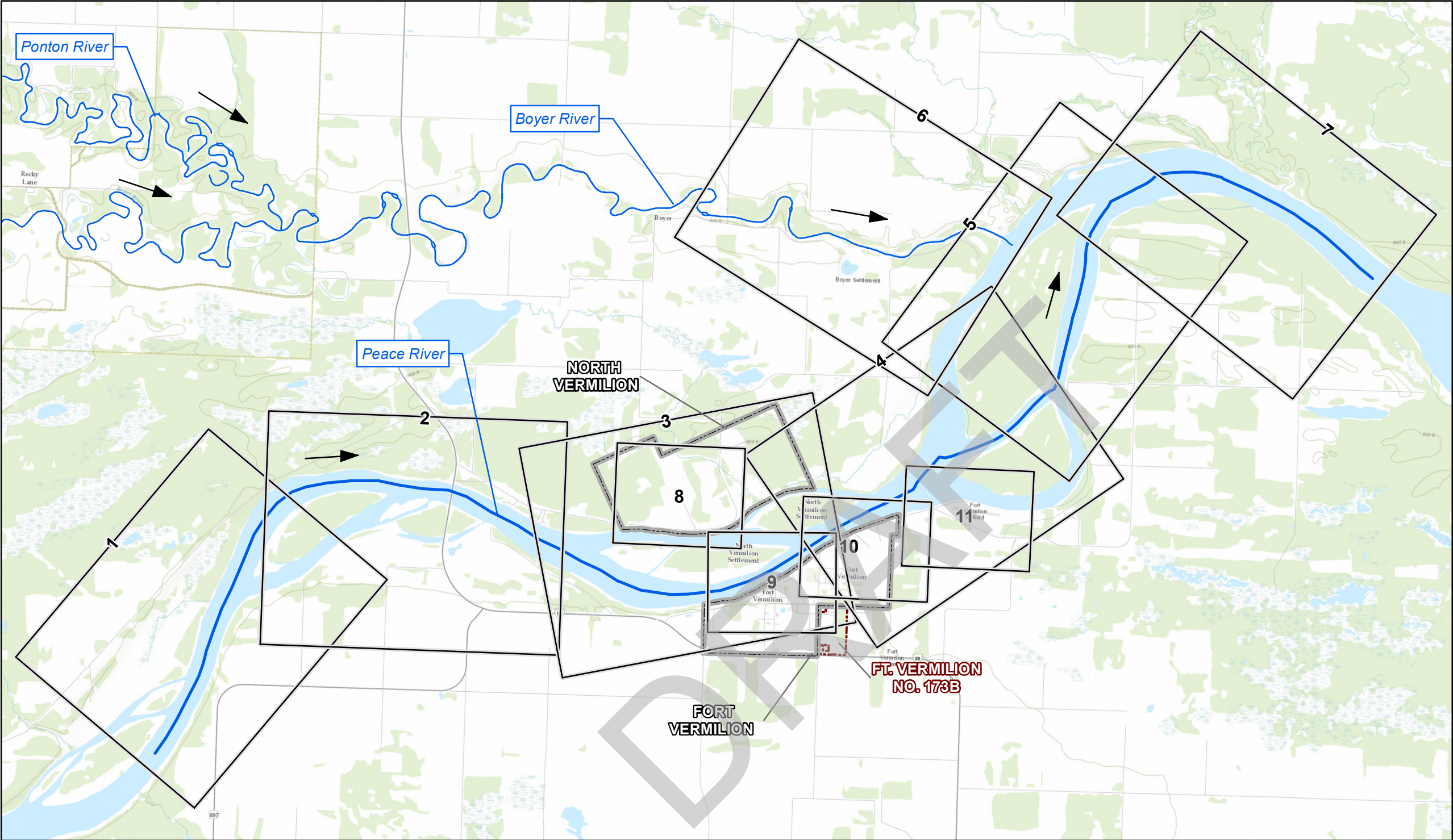
100-YEAR ICE JAM FLOOD INUNDATION MAP (11 SHEETS)

200-YEAR ICE JAM FLOOD INUNDATION MAP (11 SHEETS)

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ICE JAM FLOOD INUNDATION INDEX MAP

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Note to Users:

1. Please refer to the accompanying **Fort Vermilion Flood Hazard Study** (issued 31 March 2021) for important information concerning these maps.
2. Within the flood inundation areas shown on this map, there may be isolated pockets of high ground. To determine whether or not a particular site is subject to flooding, reference should be made to the computed flood levels in conjunction with site-specific surveys where detailed definition is required.
3. Non-riverine and local sources of water have not been considered, and structures such roads and railways can restrict water flow and affect local flood levels. Channel obstruction, local stormwater inflow, groundwater seepage or other land drainage can cause flood levels to exceed those indicated on the map. Lands adjacent to a flooded area may be subject to flooding from tributary streams not indicated on the maps.
4. The flood inundation area is shown above the line work for bridges and flood control structures that are below flood levels.

Definitions:

1. **Flood Inundation Mapping** - Delineates flood inundation areas, showing the extent of one or more flood scenarios under existing condtions. Depending on the particular flood scenario, the mapping may be divided into multiple zones. Flood inundation mapping is typically used for near real-time emergency response planning and operations.
2. **Flood Inundation Area** - The area inundated during a particular flood scenario under existing conditions. The flood inundation area may be divided into multiple zones, including isolated areas that may become inundated due to groundwater seepage or other subsurface connections. Flood inundation areas may change as a result of future development or flow obstructions.
3. **Flood Scenario** - Water level conditions that describe a particular flood event. Flood scenarios under ice jam conditions represent a range of water levels for a selected return period determined from a frequency analysis of historical water levels due to ice jam flooding. The flood scenarios included with this map set include the 50-year, 100-year and 200-year ice jam flood events.

Data Sources and References:

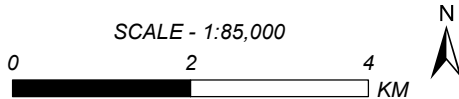
1. Orthophoto imagery acquired by OGL Engineering for Alberta Environment and Parks: *Imagery acquired on 16 June 2019.*
2. Base data from NRCan, Alberta Environment and Parks, AltaLIS, and NRCan.
3. Additional base mapping from Esri.

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- ➔ FLOW DIRECTION
- MAP SHEET
- ▭ MUNICIPAL BOUNDARY
- ▭ INDIAN RESERVE
- STUDY REACH
- MAJOR TRIBUTARY



Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	MGB	GIS	REH	Reviewer	DJH
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Job: 1006302	Date: 31-MAR-2020
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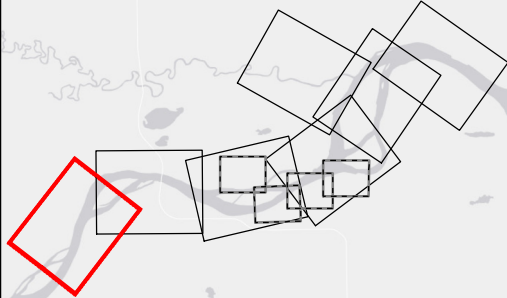
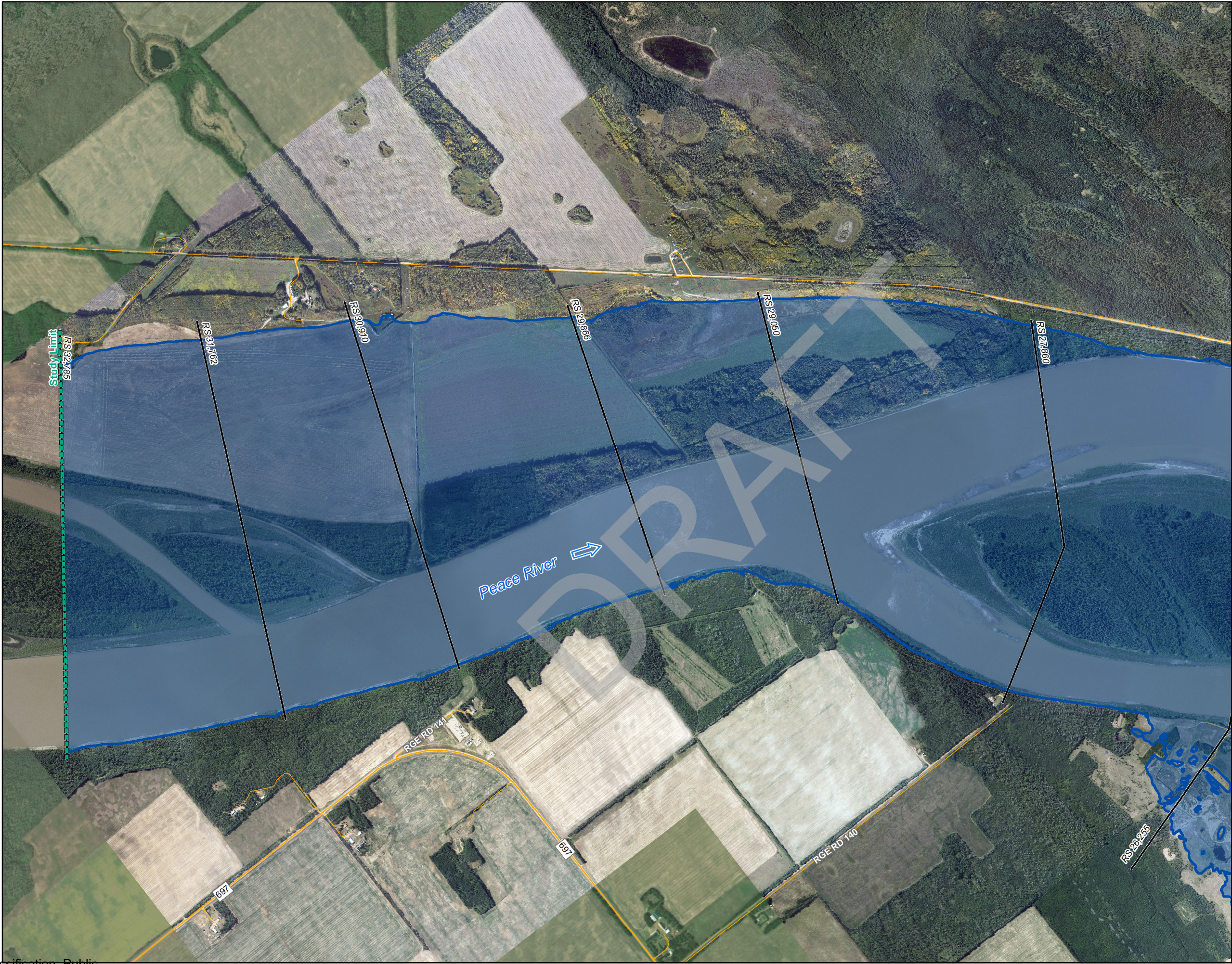
FORT VERMILION FLOOD HAZARD STUDY

ICE JAM FLOOD INUNDATION
INDEX MAP

INDEX MAP

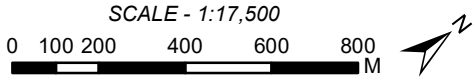
**50-YEAR ICE JAM FLOOD INUNDATION MAP
(SHEETS 1 TO 11)**

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- FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 50-YEAR FLOOD INUNDATION EXTENT

SHEET 2 ↓

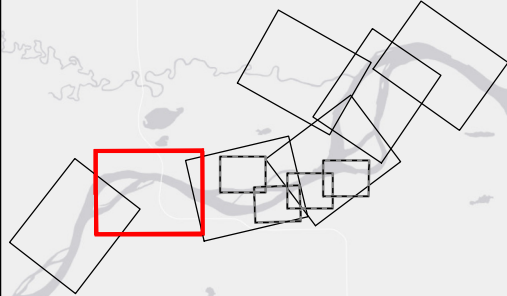
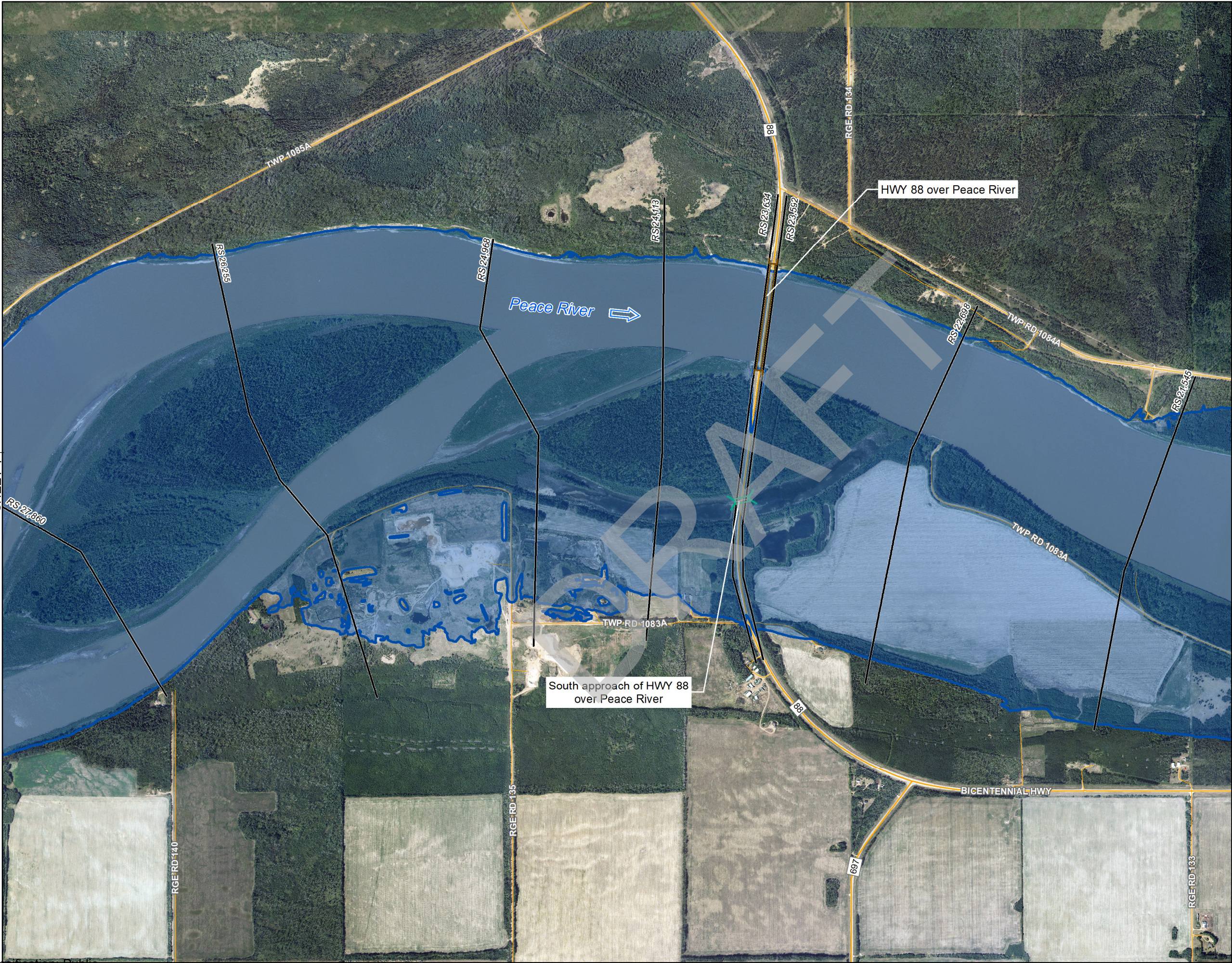


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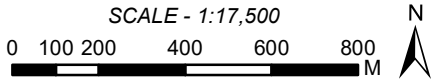
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Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

50-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
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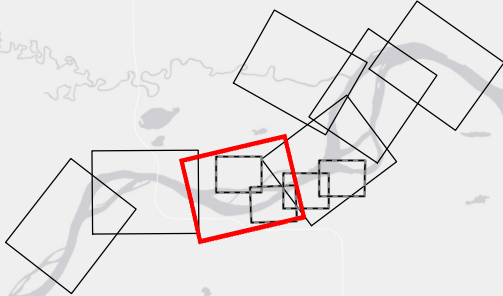


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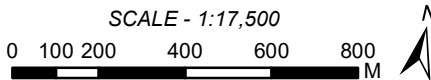
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50-YEAR ICE JAM
FLOOD INUNDATION MAP



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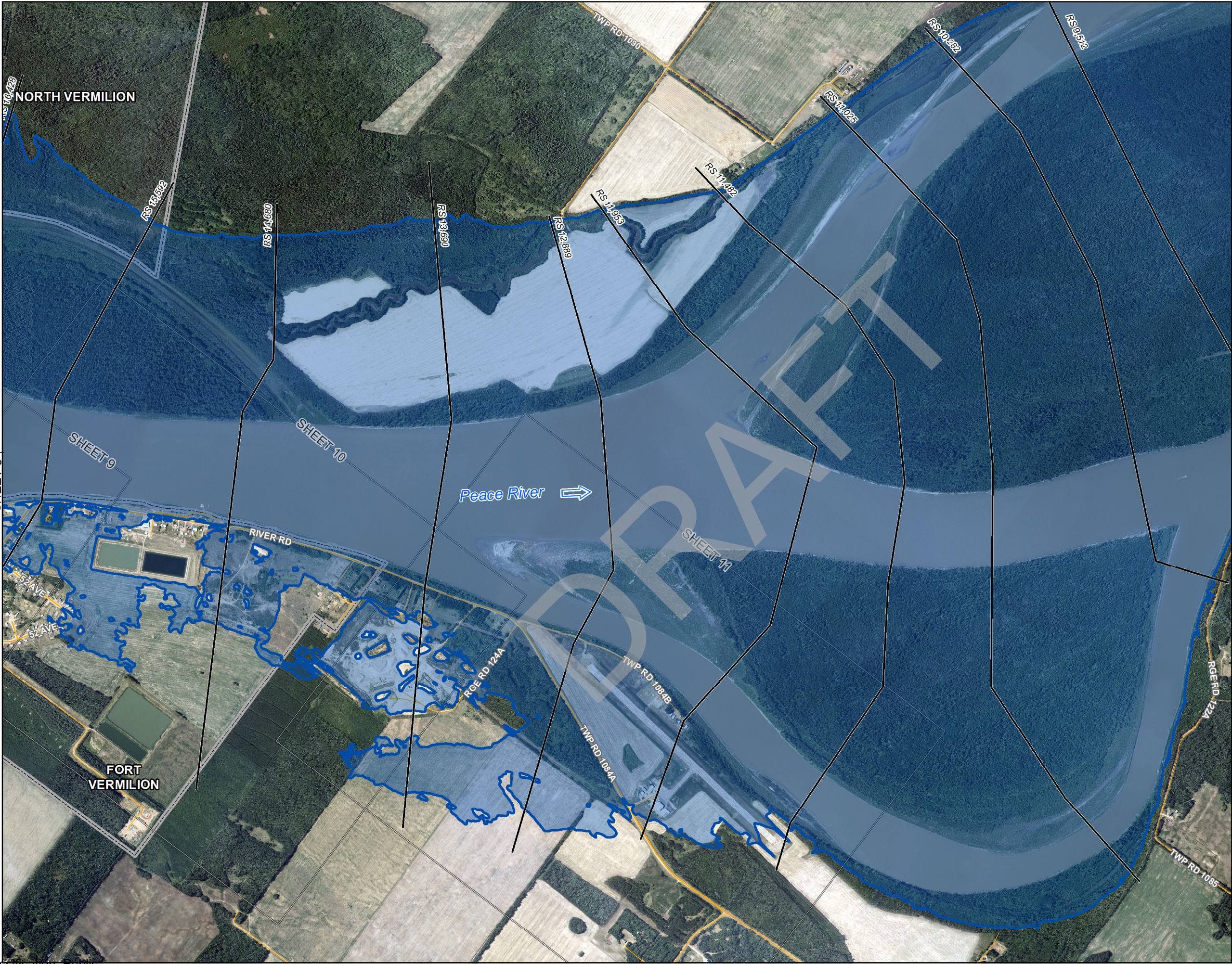




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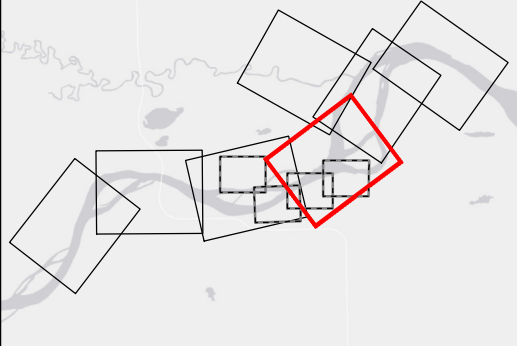
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FORT VERMILION FLOOD HAZARD STUDY


50-YEAR ICE JAM
FLOOD INUNDATION MAP











 FLOW DIRECTION


 BRIDGE


 CULVERT


 LOCAL ROAD


 PROVINCIAL ROAD

 STUDY LIMIT

 MODEL CROSS SECTION

 INDIAN RESERVE


 MUNICIPAL BOUNDARY

 50-YEAR FLOOD INUNDATION EXTENT

SCALE - 1:17,500

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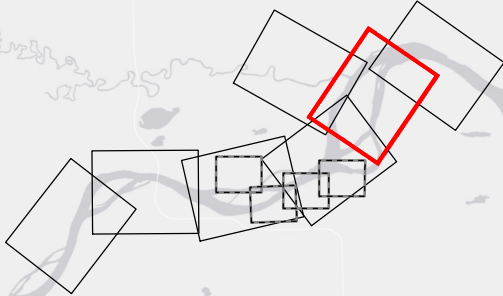
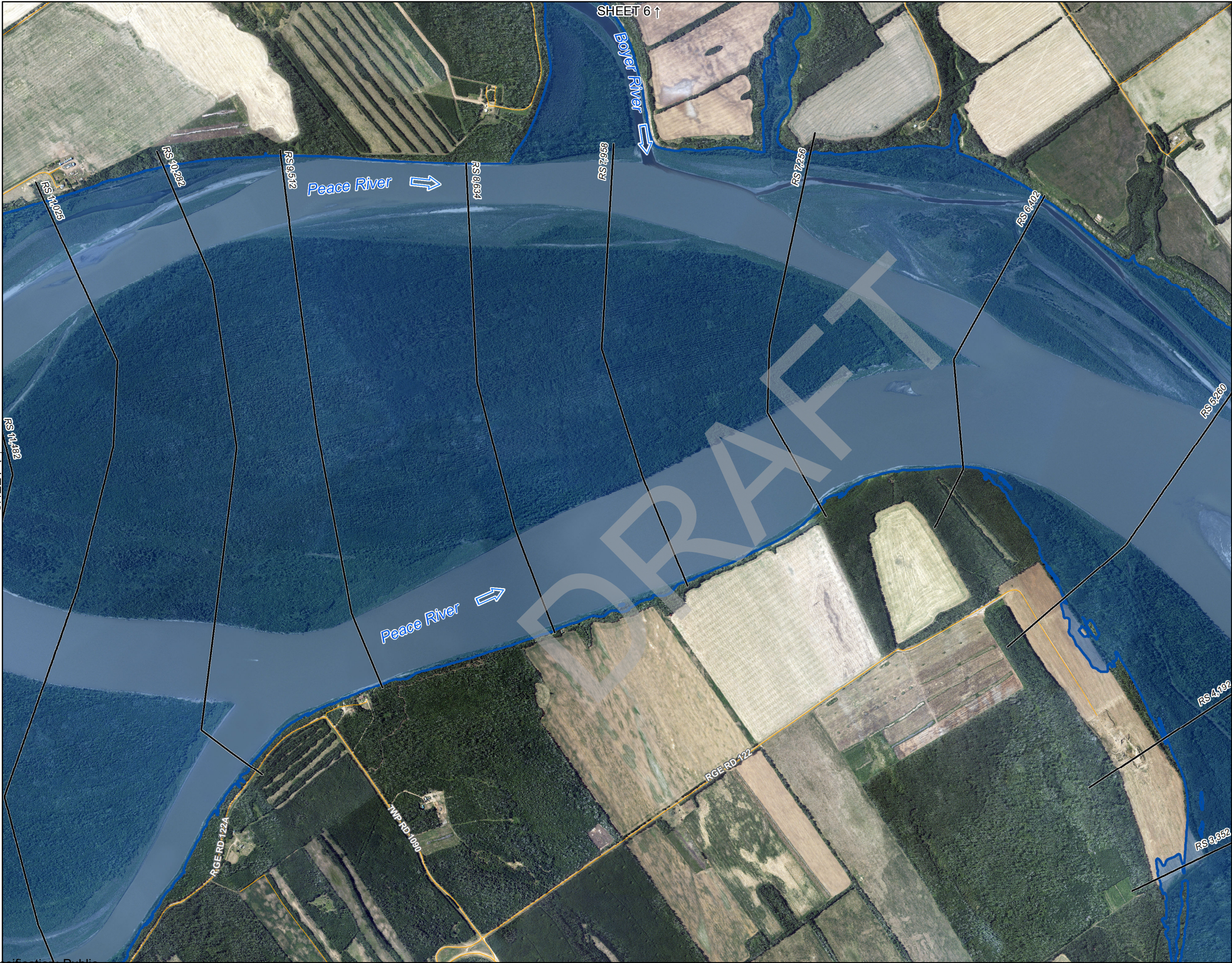
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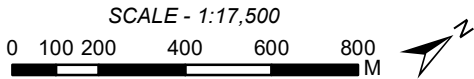
FORT VERMILION FLOOD HAZARD STUDY

50-YEAR ICE JAM
FLOOD INUNDATION MAP

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- ➡ FLOW DIRECTION
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- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 50-YEAR FLOOD INUNDATION EXTENT

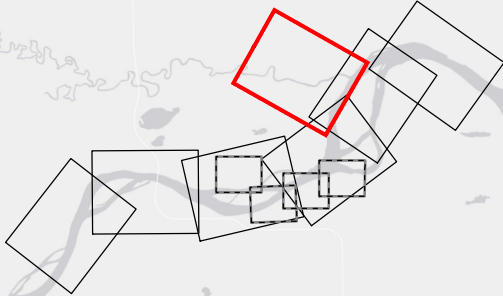


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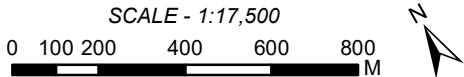
FORT VERMILION FLOOD HAZARD STUDY

50-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
- 🌉 BRIDGE
- 🚧 CULVERT
- LOCAL ROAD
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- MODEL CROSS SECTION
- 🔴 INDIAN RESERVE
- 📏 MUNICIPAL BOUNDARY
- 🔵 50-YEAR FLOOD INUNDATION EXTENT

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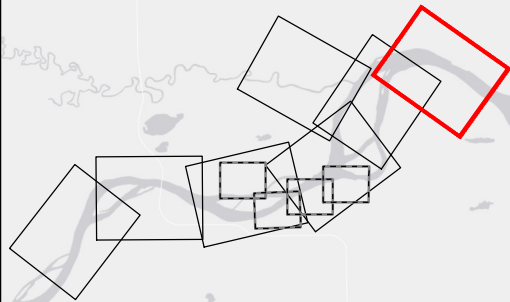
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FORT VERMILION FLOOD HAZARD STUDY

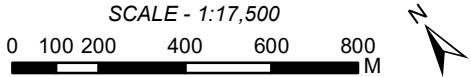
50-YEAR ICE JAM
FLOOD INUNDATION MAP



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- FLOW DIRECTION
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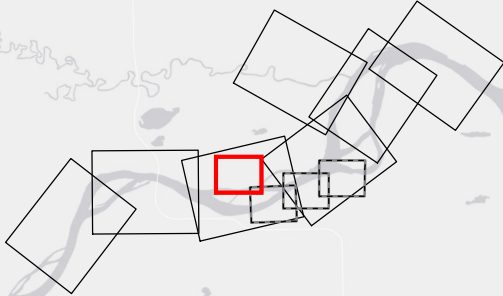
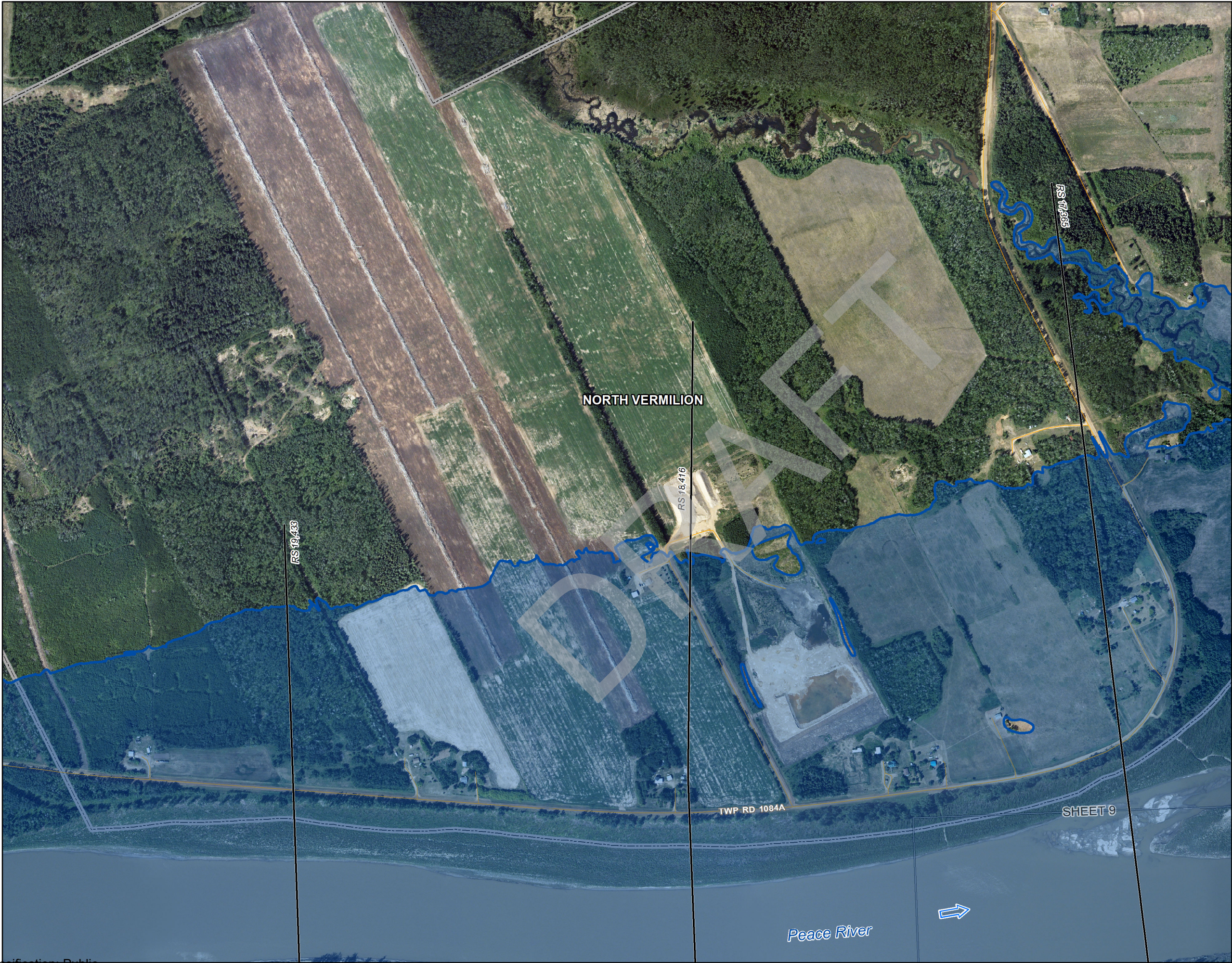


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FORT VERMILION FLOOD HAZARD STUDY

50-YEAR ICE JAM
FLOOD INUNDATION MAP



- FLOW DIRECTION
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- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 50-YEAR FLOOD INUNDATION EXTENT

SCALE - 1:7,500
0 100 200 M

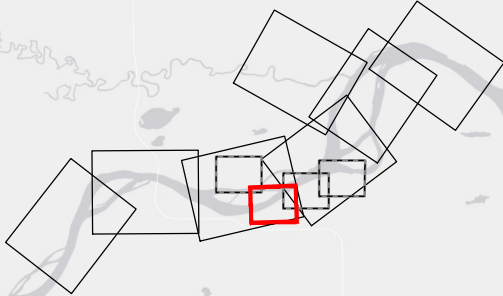
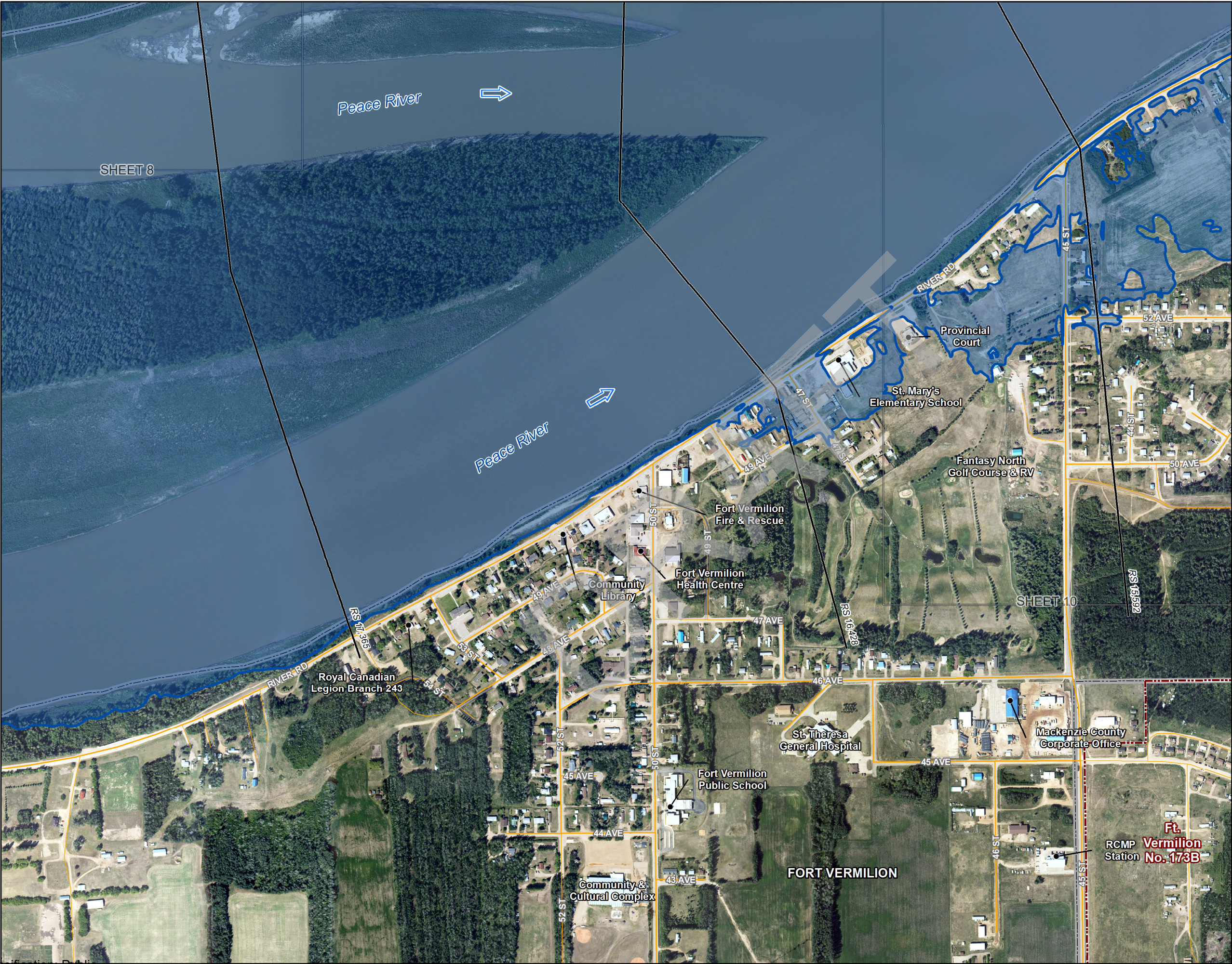


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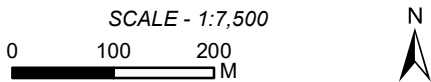
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FORT VERMILION FLOOD HAZARD STUDY

50-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
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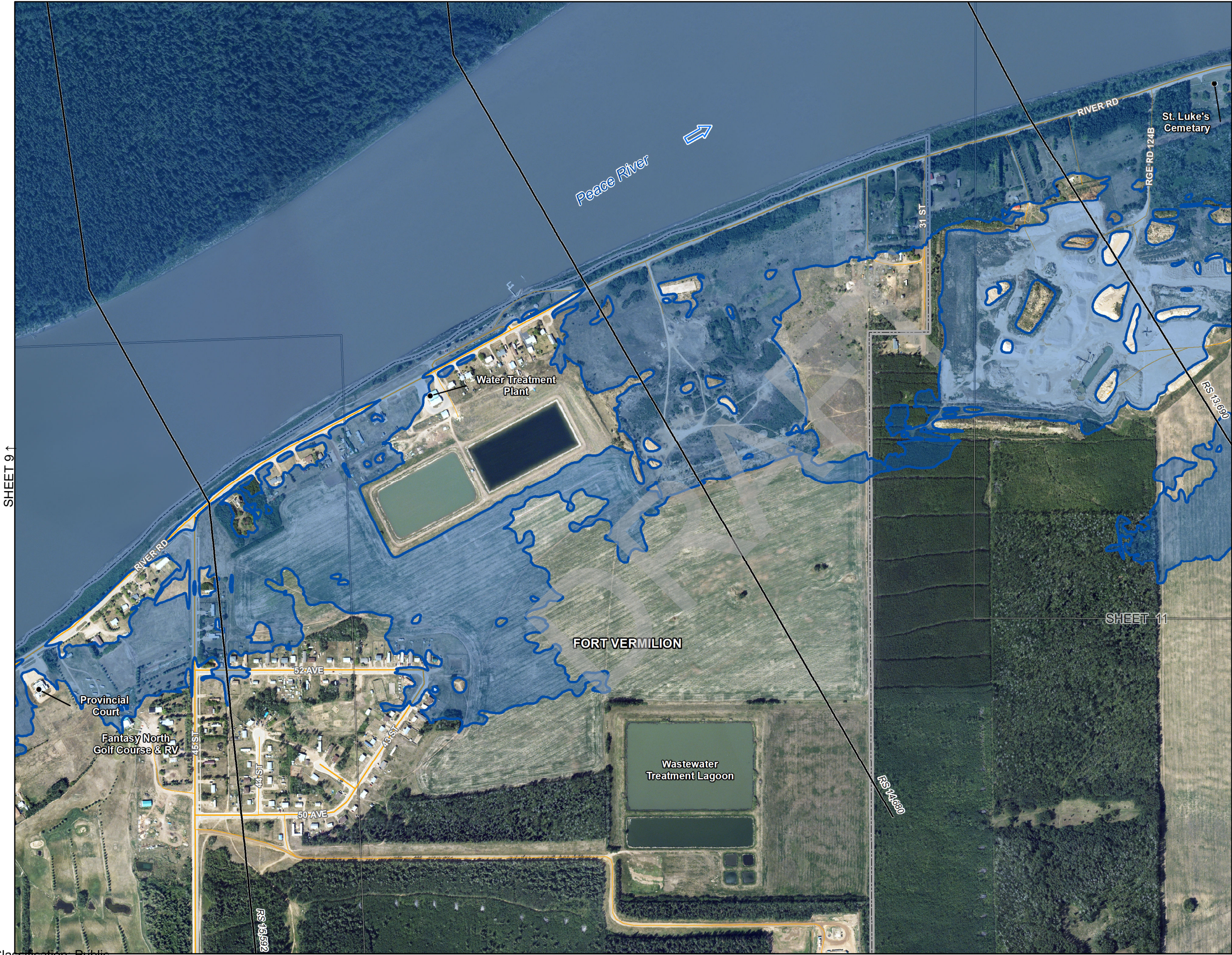
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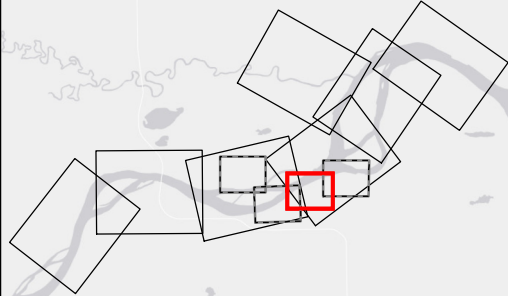
Job: 1006302 Date: 31-MAR-2021


FORT VERMILION FLOOD HAZARD STUDY


50-YEAR ICE JAM
FLOOD INUNDATION MAP











 FLOW DIRECTION


 BRIDGE


 CULVERT


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 PROVINCIAL ROAD

 STUDY LIMIT

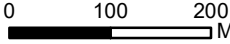
 MODEL CROSS SECTION


 INDIAN RESERVE

 MUNICIPAL BOUNDARY

 50-YEAR FLOOD INUNDATION EXTENT

SCALE - 1:7,500

 0 100 200 M

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Coordinate System: NAD 1983 CSRS 3TM 117;
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Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

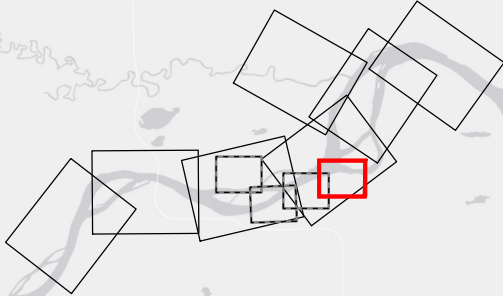
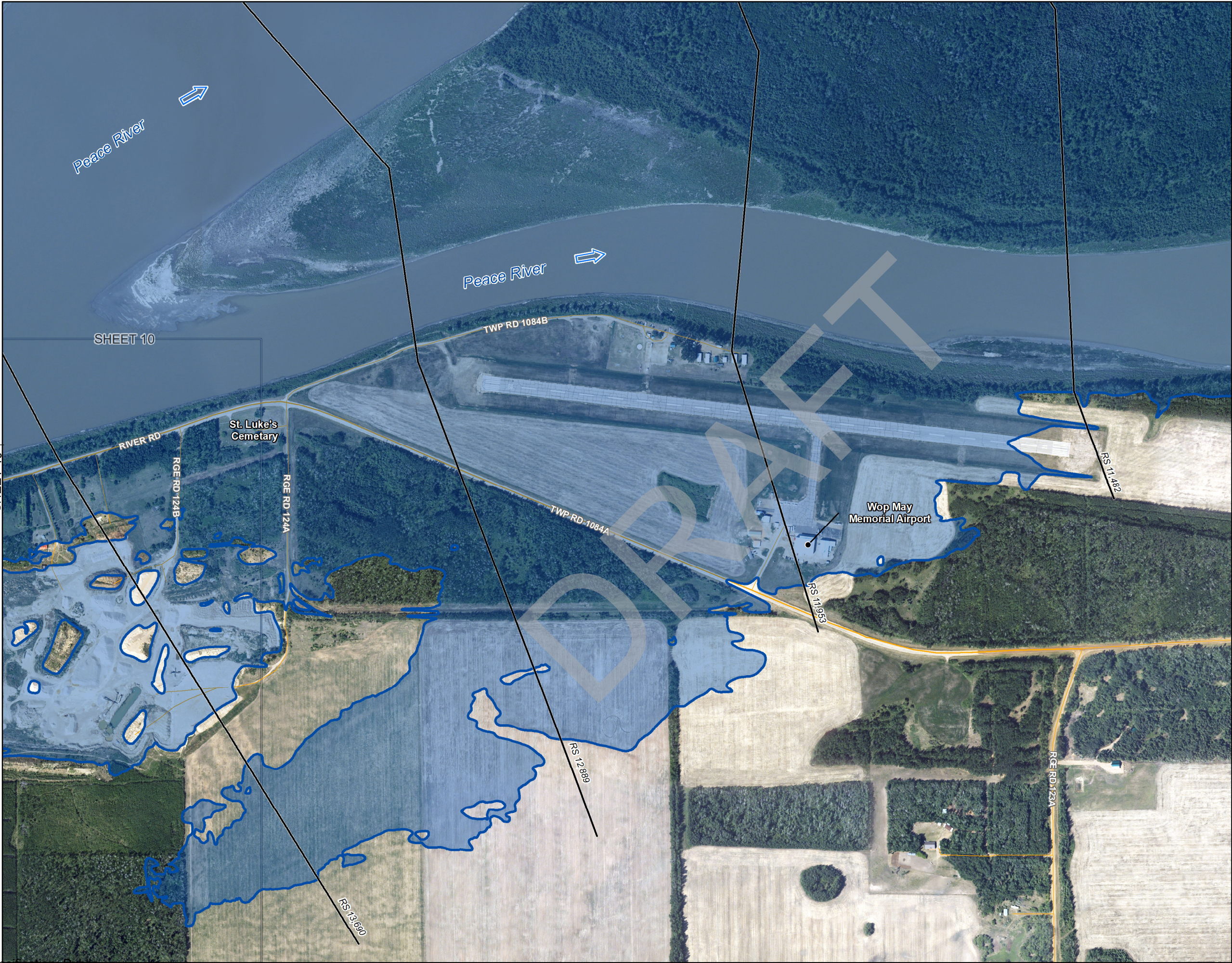
FORT VERMILION FLOOD HAZARD STUDY

50-YEAR ICE JAM
FLOOD INUNDATION MAP

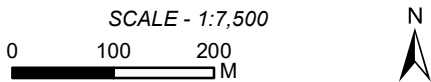
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Classification: Public

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Coordinate System: NAD 1983 CSRS 3TM 117;
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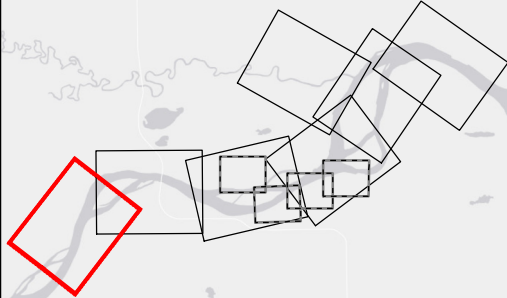
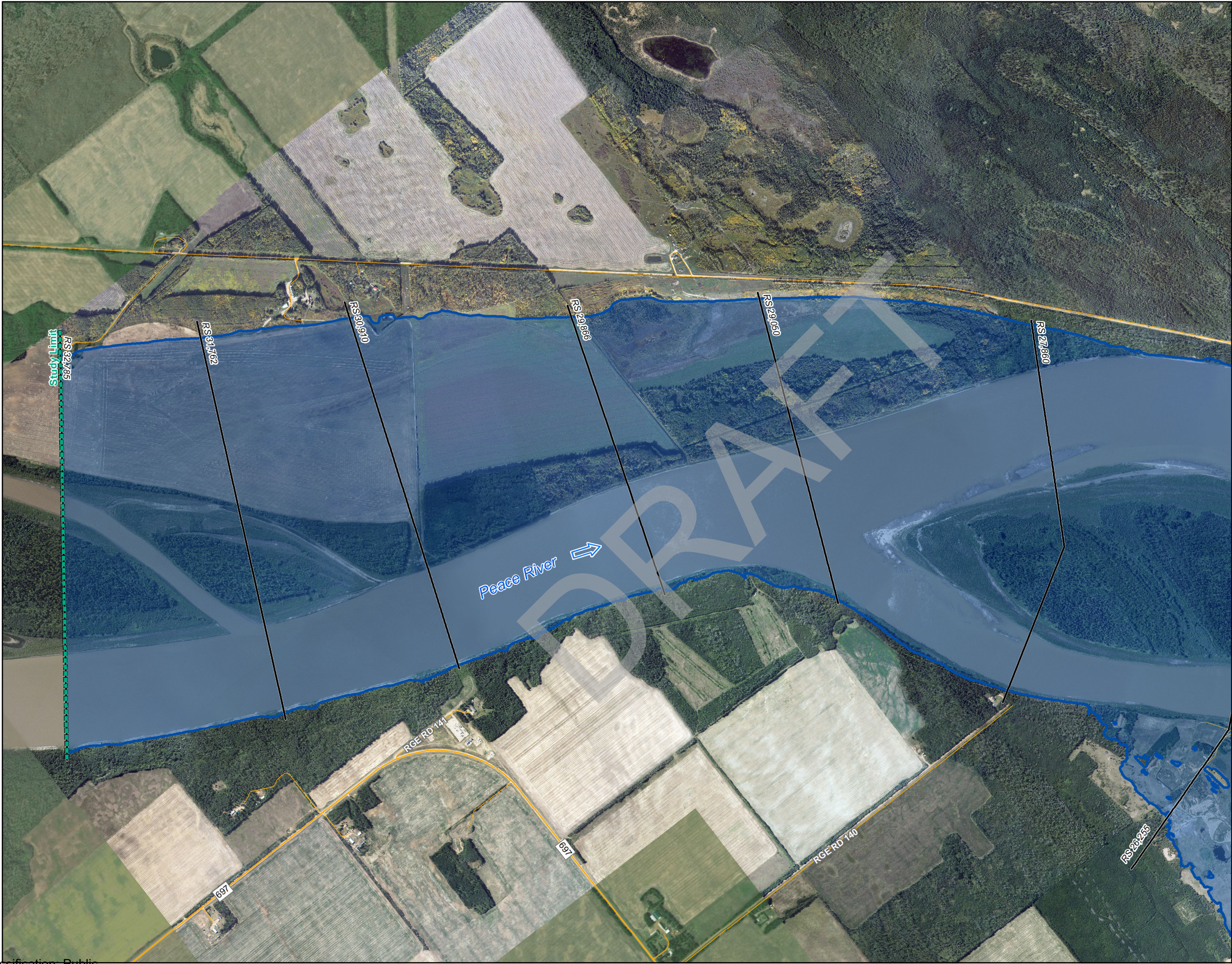
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FORT VERMILION FLOOD HAZARD STUDY

50-YEAR ICE JAM
FLOOD INUNDATION MAP

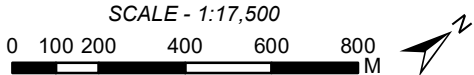
100-YEAR ICE JAM FLOOD INUNDATION MAP
(SHEETS 1 TO 11)

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SHEET 2 ↓



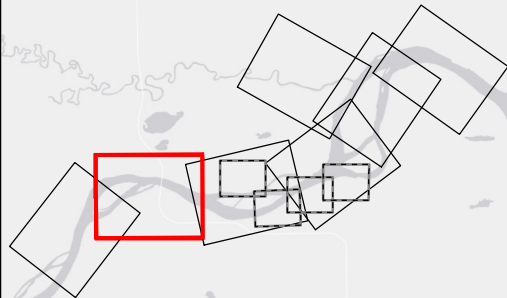
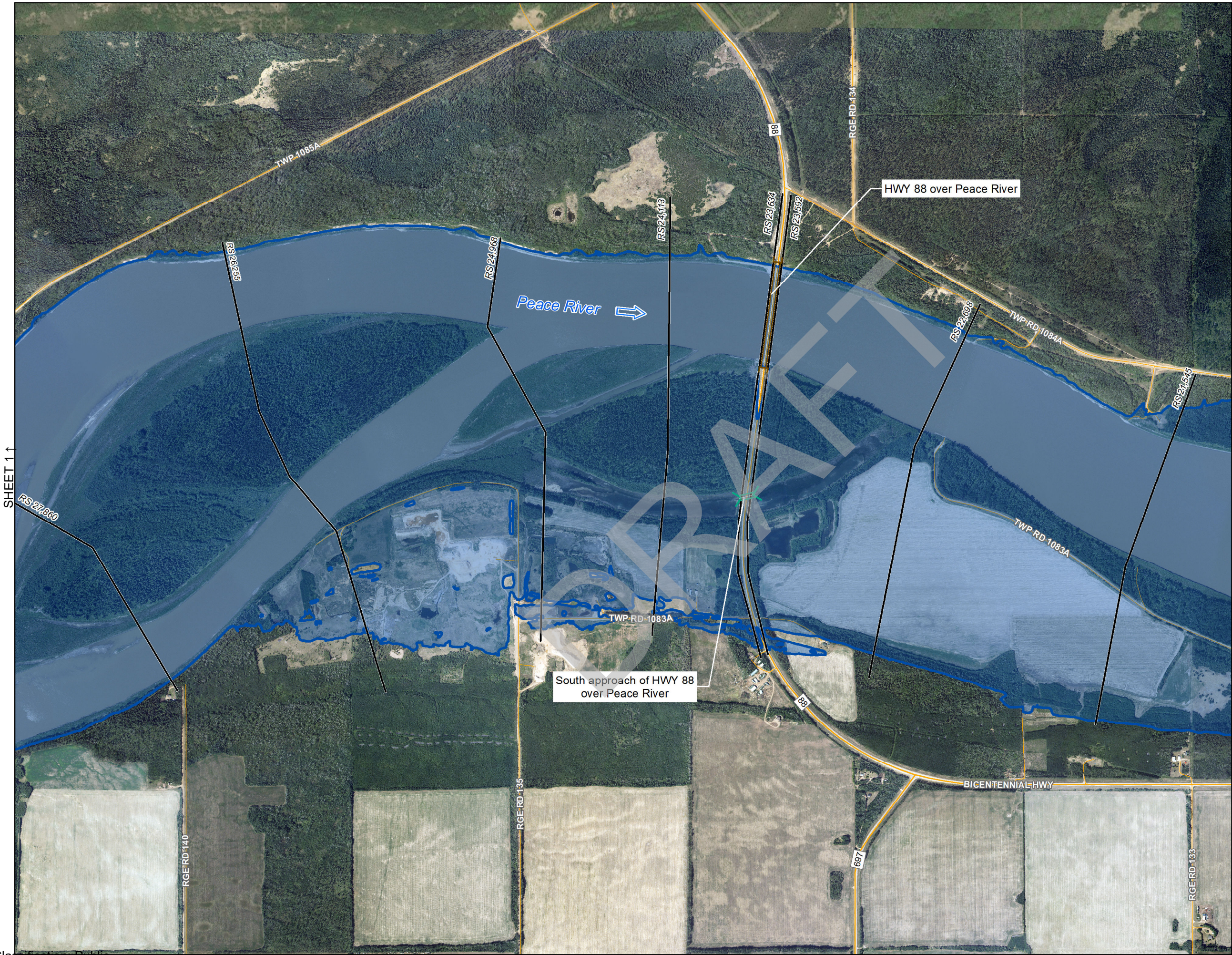
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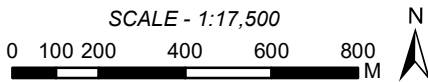
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FORT VERMILION FLOOD HAZARD STUDY

100-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
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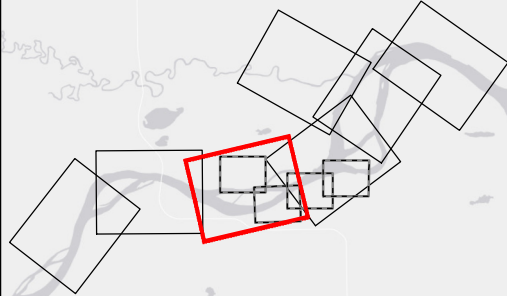
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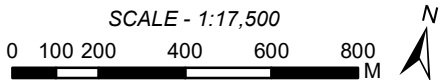
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FORT VERMILION FLOOD HAZARD STUDY

100-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
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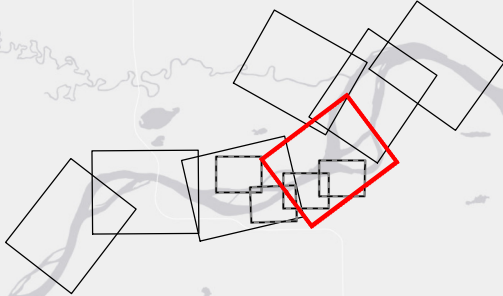
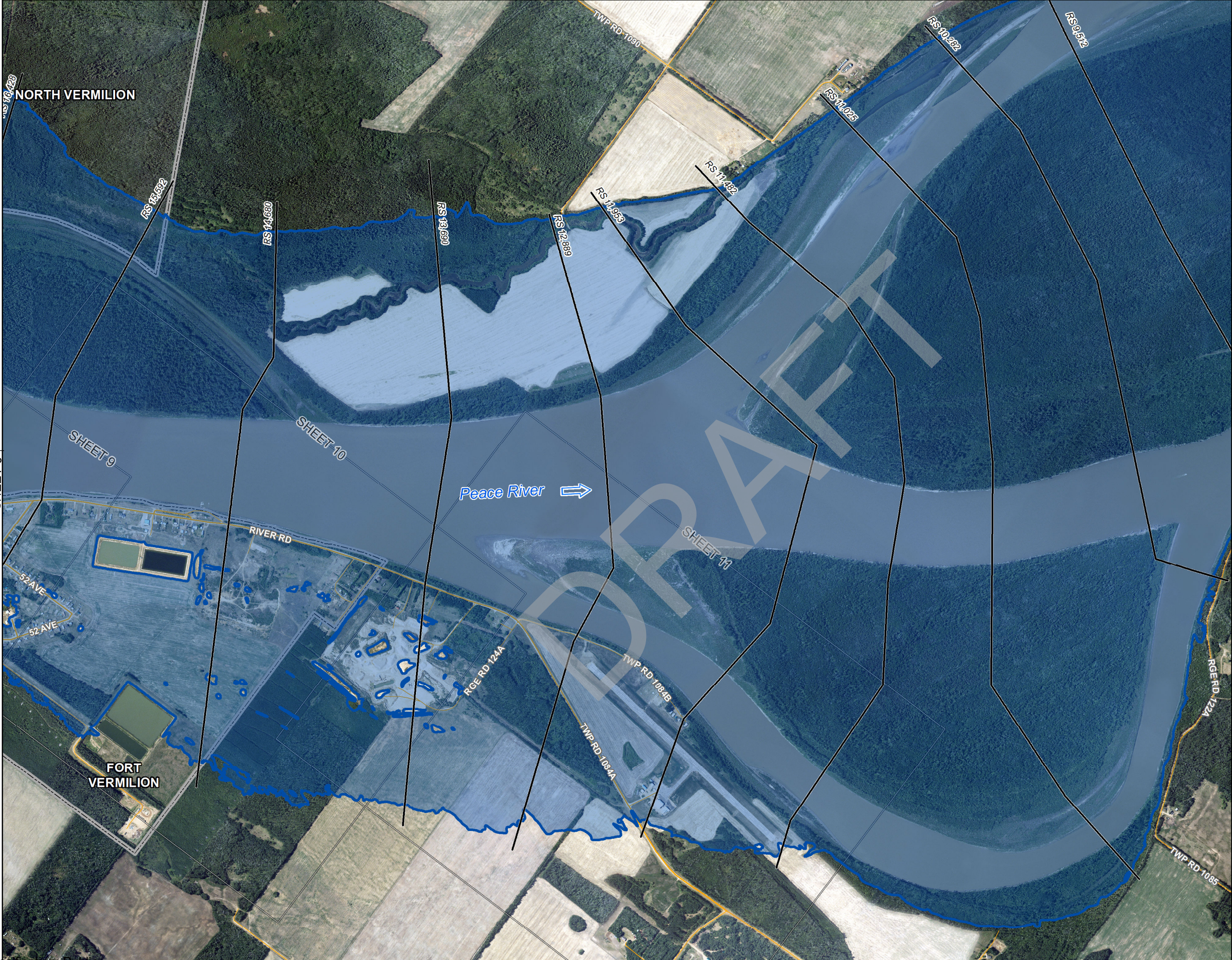
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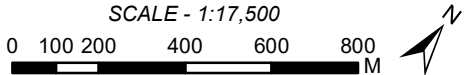
FORT VERMILION FLOOD HAZARD STUDY

100-YEAR ICE JAM
FLOOD INUNDATION MAP

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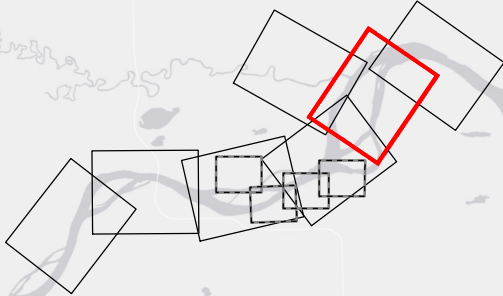
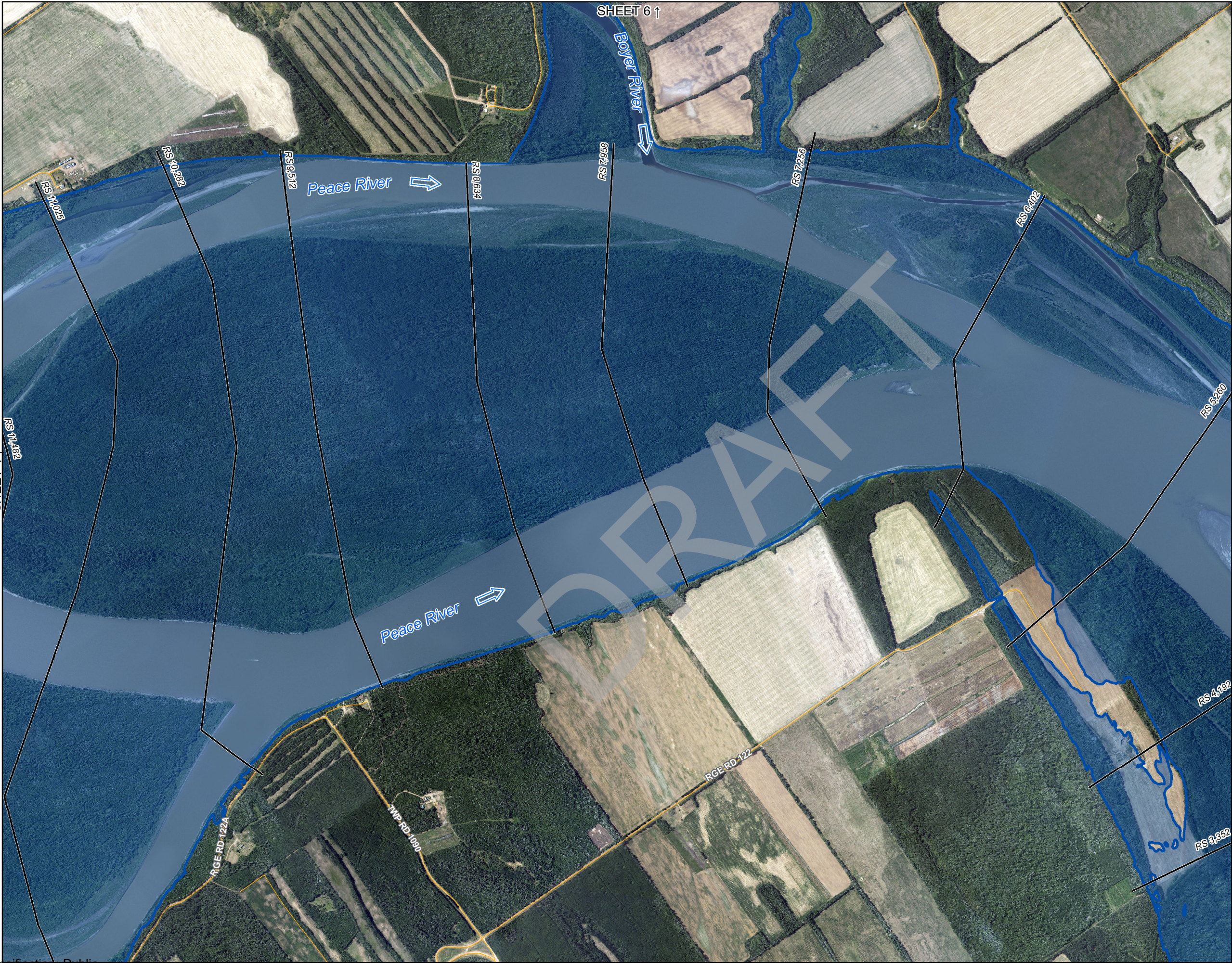


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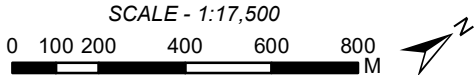
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FORT VERMILION FLOOD HAZARD STUDY

100-YEAR ICE JAM
FLOOD INUNDATION MAP



- FLOW DIRECTION
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- MUNICIPAL BOUNDARY
- 100-YEAR FLOOD INUNDATION EXTENT



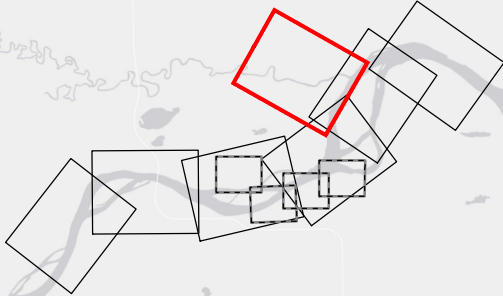
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Engineer	MGB	GIS	REH	Reviewer	DJH
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Job: 1006302 Date: 31-MAR-2021

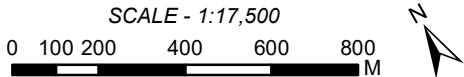
FORT VERMILION FLOOD HAZARD STUDY

100-YEAR ICE JAM
FLOOD INUNDATION MAP



- FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 100-YEAR FLOOD INUNDATION EXTENT

SHEET 5 ↓



Coordinate System: NAD 1983 CSRS 3TM 117;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	MGB	GIS	REH	Reviewer	DJH
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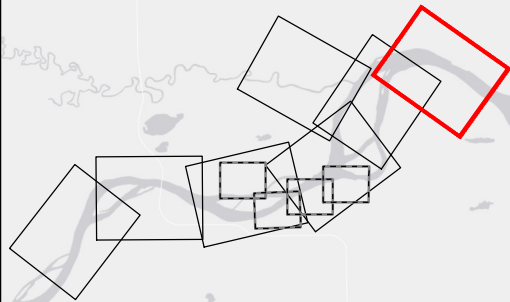
Job: 1006302 Date: 31-MAR-2021

FORT VERMILION FLOOD HAZARD STUDY

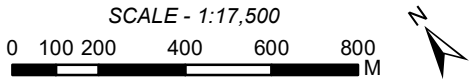
100-YEAR ICE JAM
FLOOD INUNDATION MAP



SHEET 6 ↑



- FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 100-YEAR FLOOD INUNDATION EXTENT

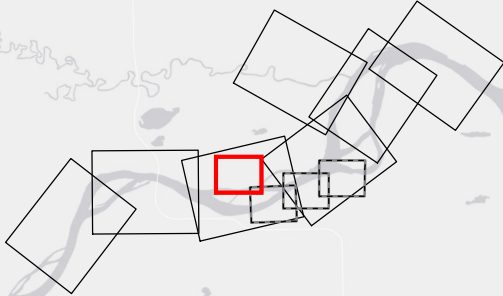
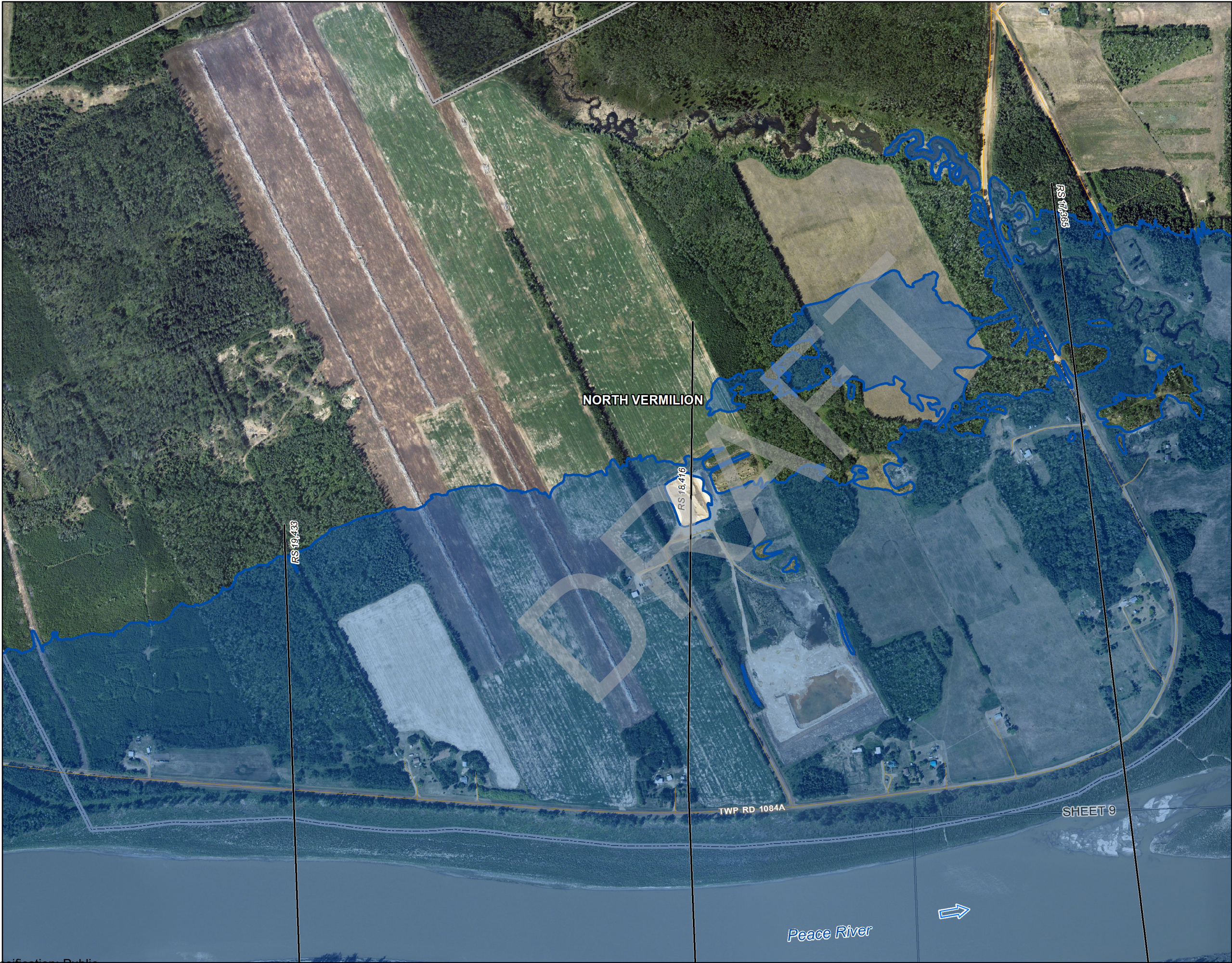


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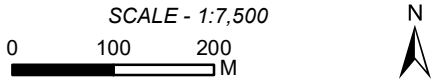
Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

100-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
- 🌉 BRIDGE
- 🚧 CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- 🔴 INDIAN RESERVE
- 🏠 MUNICIPAL BOUNDARY
- 🔵 100-YEAR FLOOD INUNDATION EXTENT

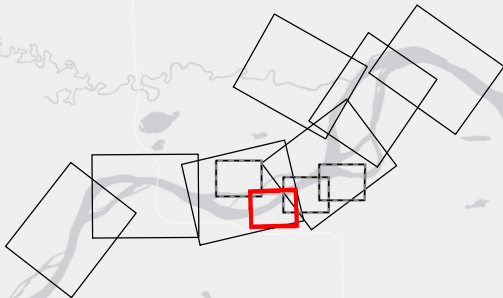
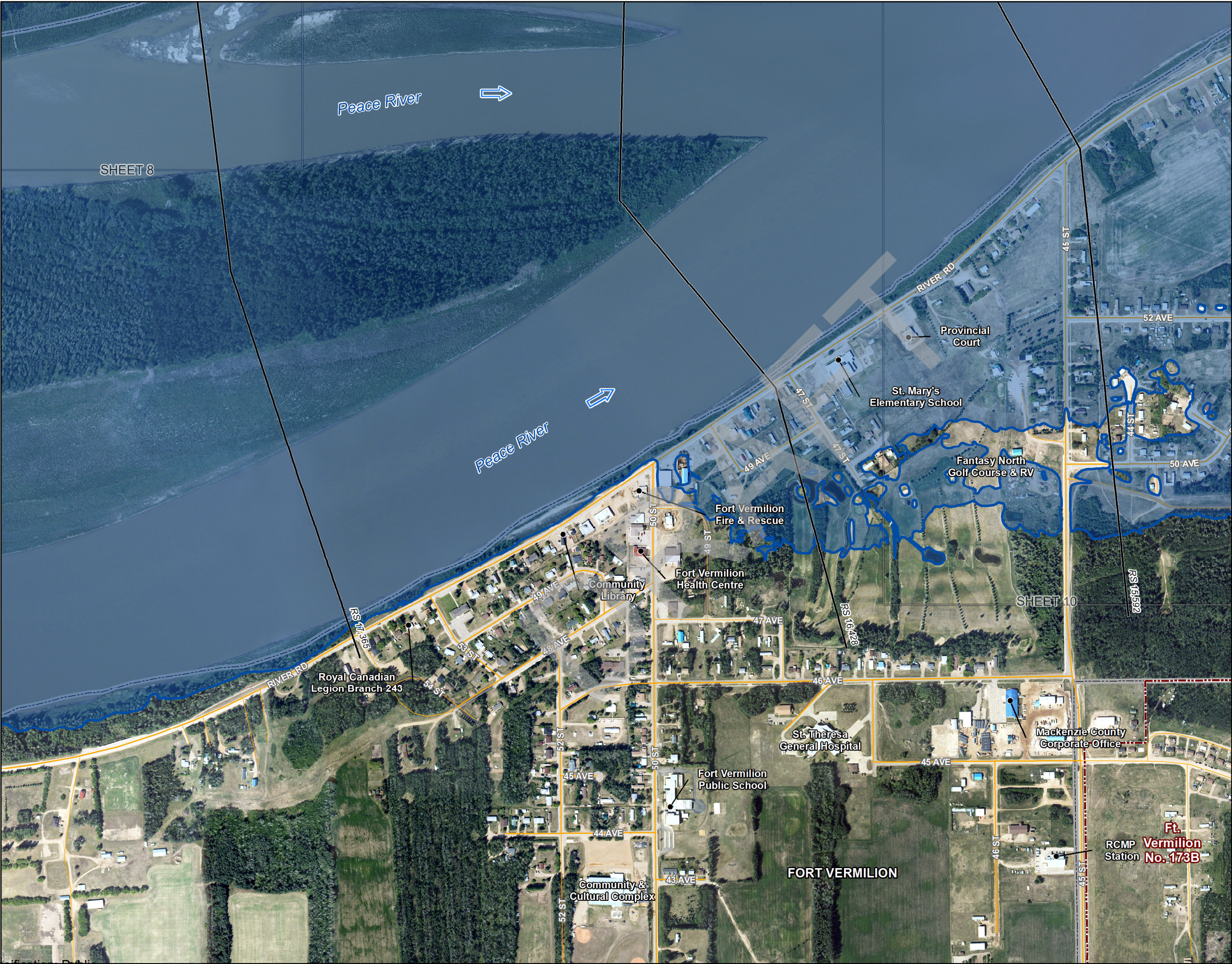


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Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

100-YEAR ICE JAM
FLOOD INUNDATION MAP



- FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 100-YEAR FLOOD INUNDATION EXTENT

SCALE - 1:7,500
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 117;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

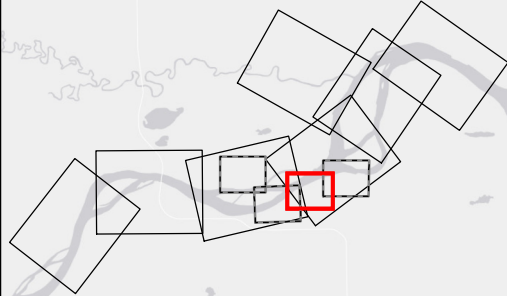
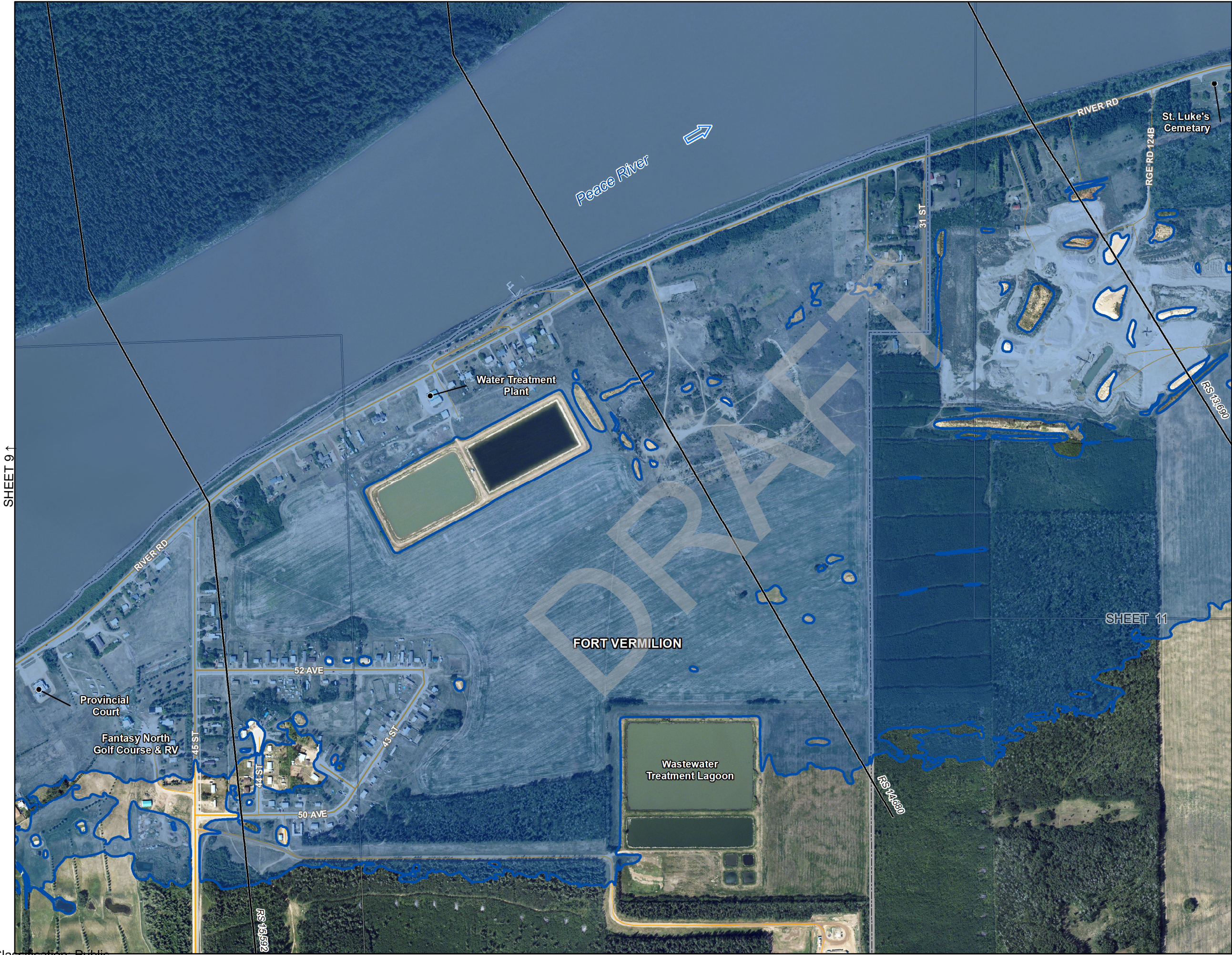
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Job: 1006302	Date: 31-MAR-2021
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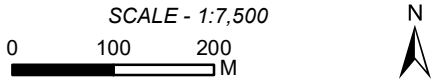
FORT VERMILION FLOOD HAZARD STUDY

100-YEAR ICE JAM
FLOOD INUNDATION MAP

SHEET 9 OF 11



- ➡ FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 100-YEAR FLOOD INUNDATION EXTENT

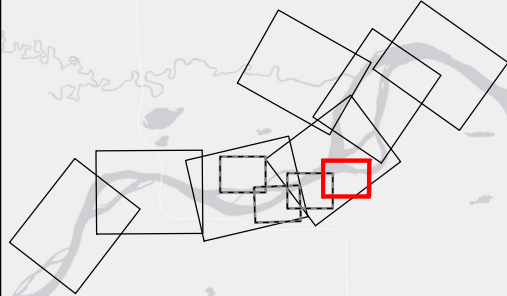
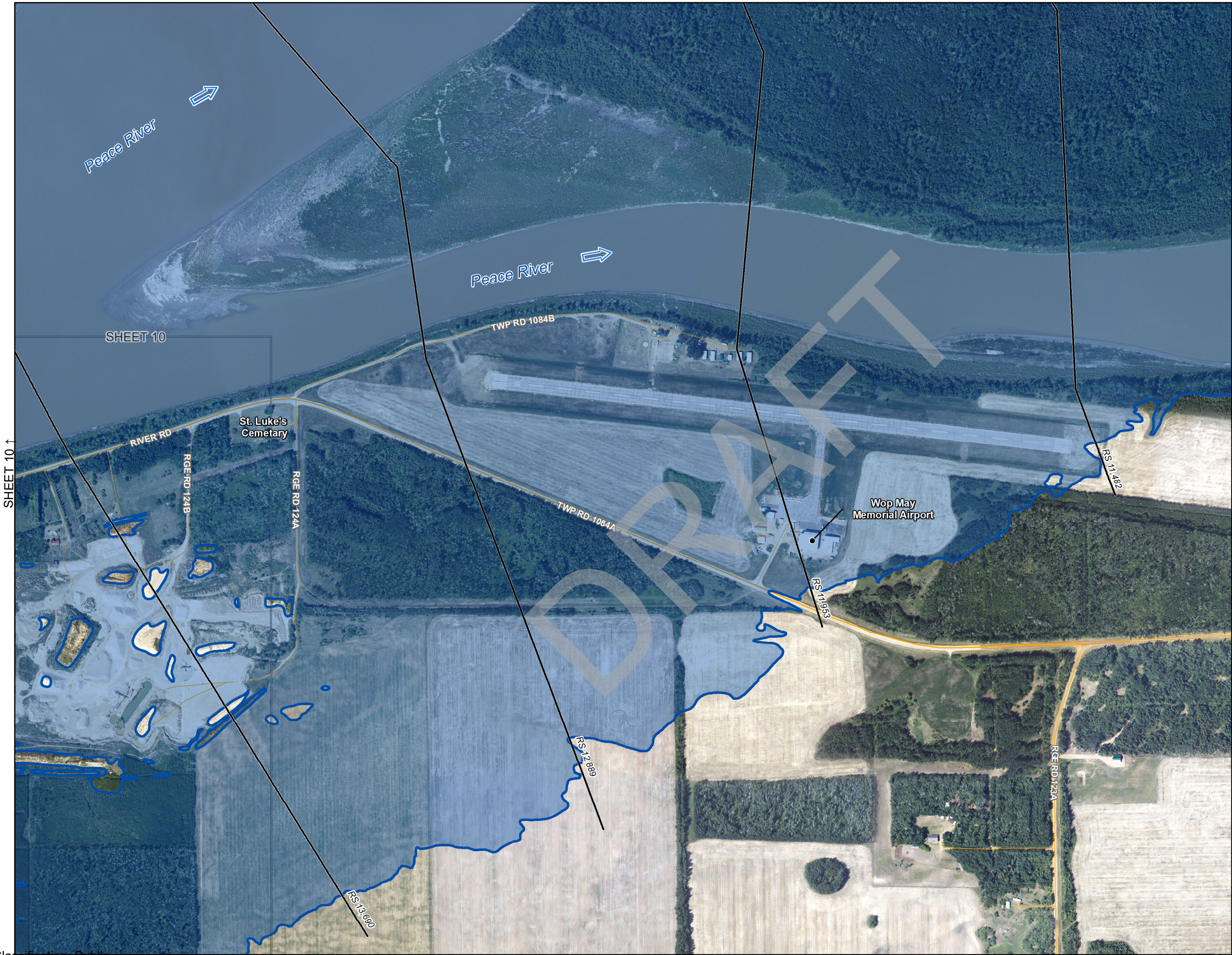


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Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

100-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
- BRIDGE
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- STUDY LIMIT
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- MUNICIPAL BOUNDARY
- 100-YEAR FLOOD INUNDATION EXTENT

SCALE - 1:7,500
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Coordinate System: NAD 1983 CSRS 3TM 117;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

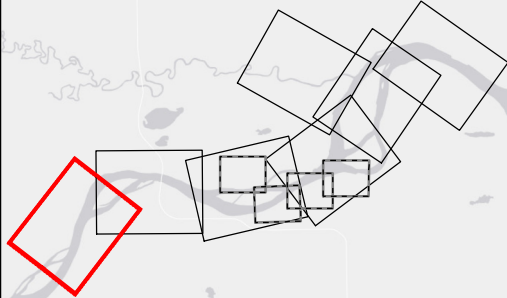
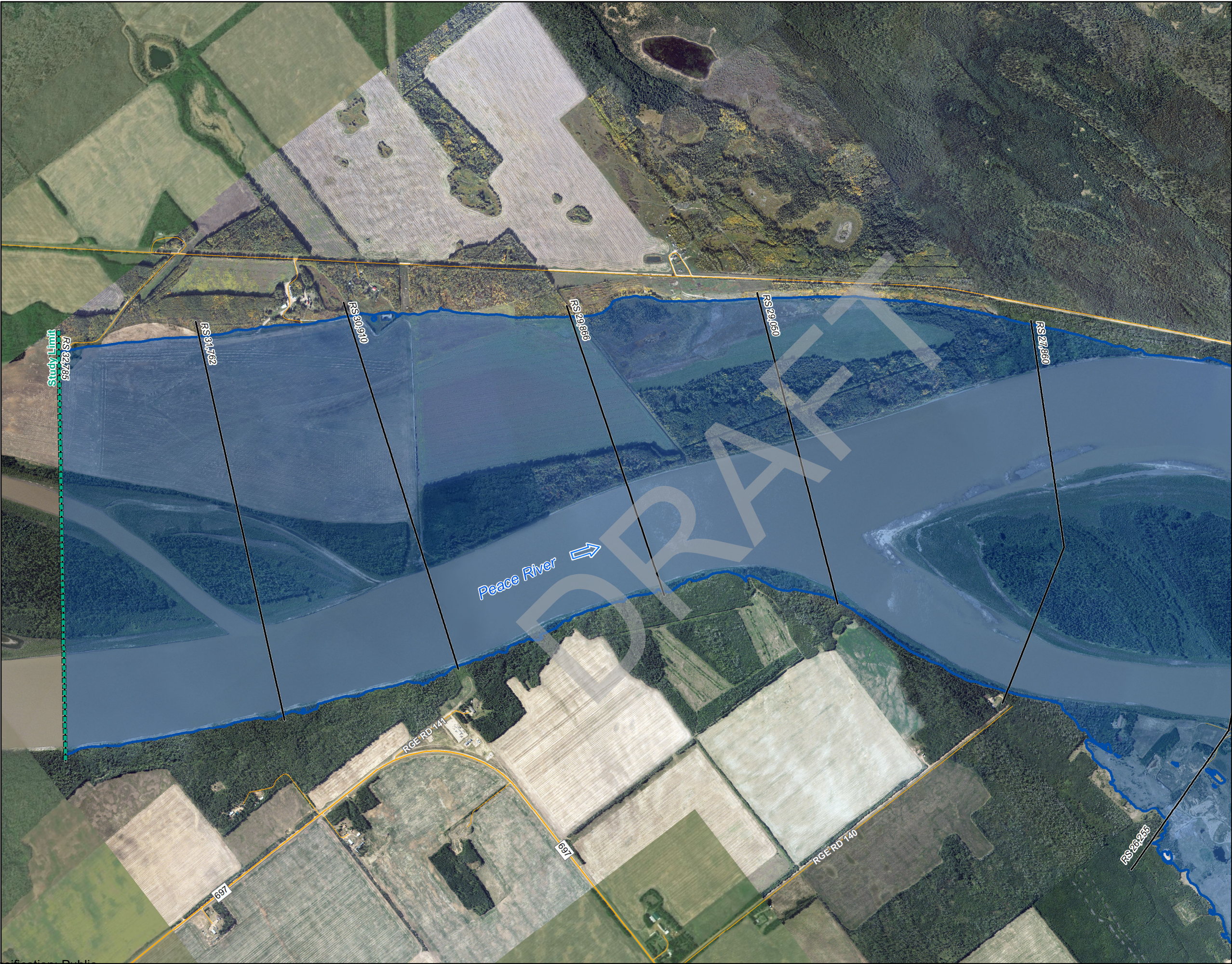
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Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

100-YEAR ICE JAM
FLOOD INUNDATION MAP

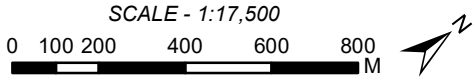
200-YEAR ICE JAM FLOOD INUNDATION MAP
(SHEETS 1 TO 11)

DRAFT



- FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 200-YEAR FLOOD INUNDATION EXTENT

SHEET 2 ↓

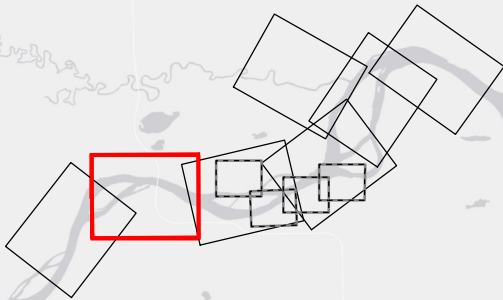
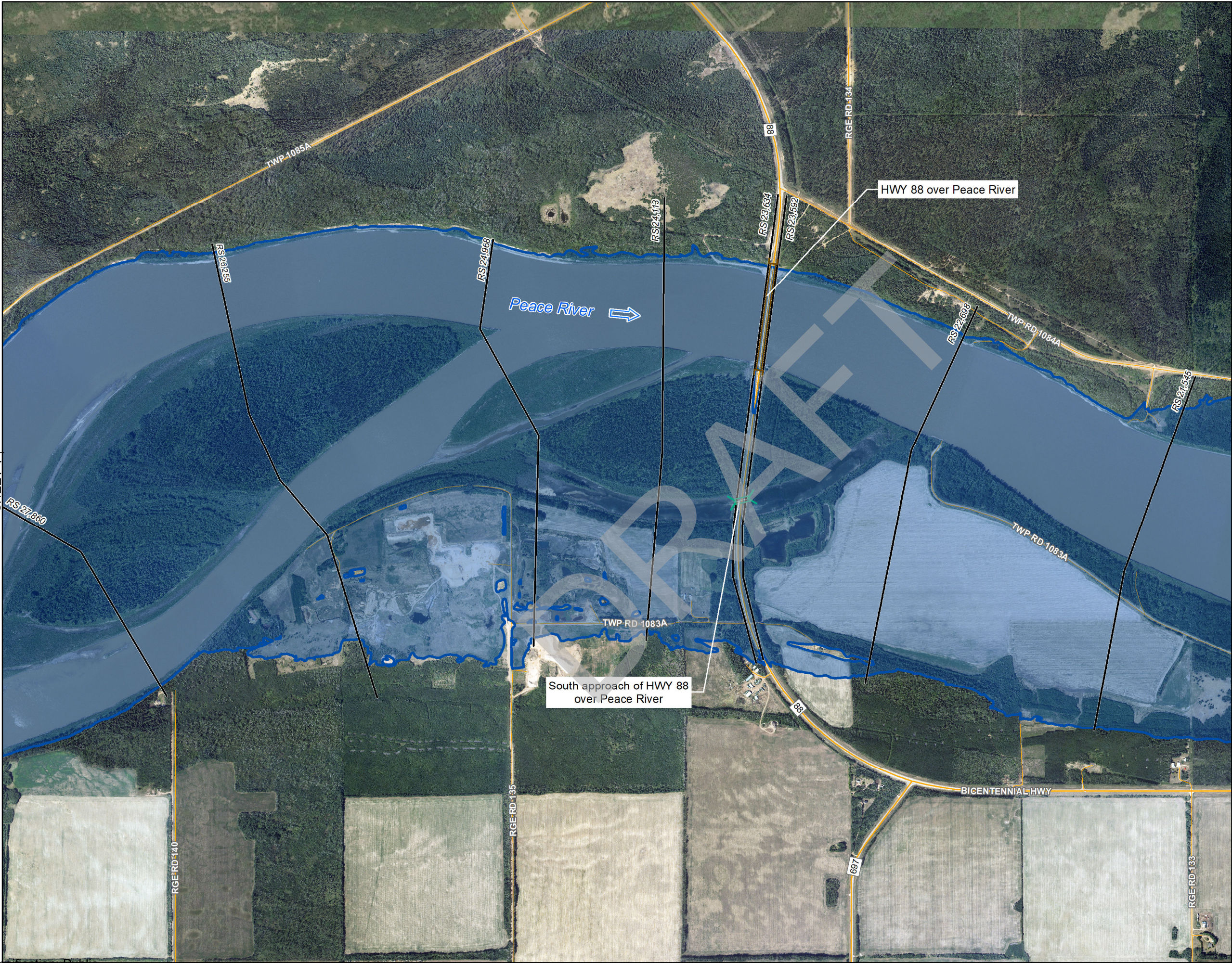


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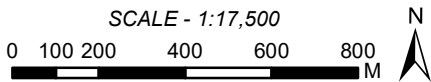
Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

200-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 200-YEAR FLOOD INUNDATION EXTENT

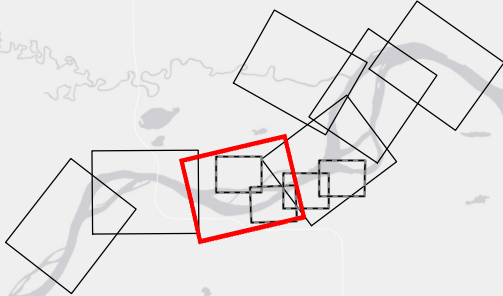
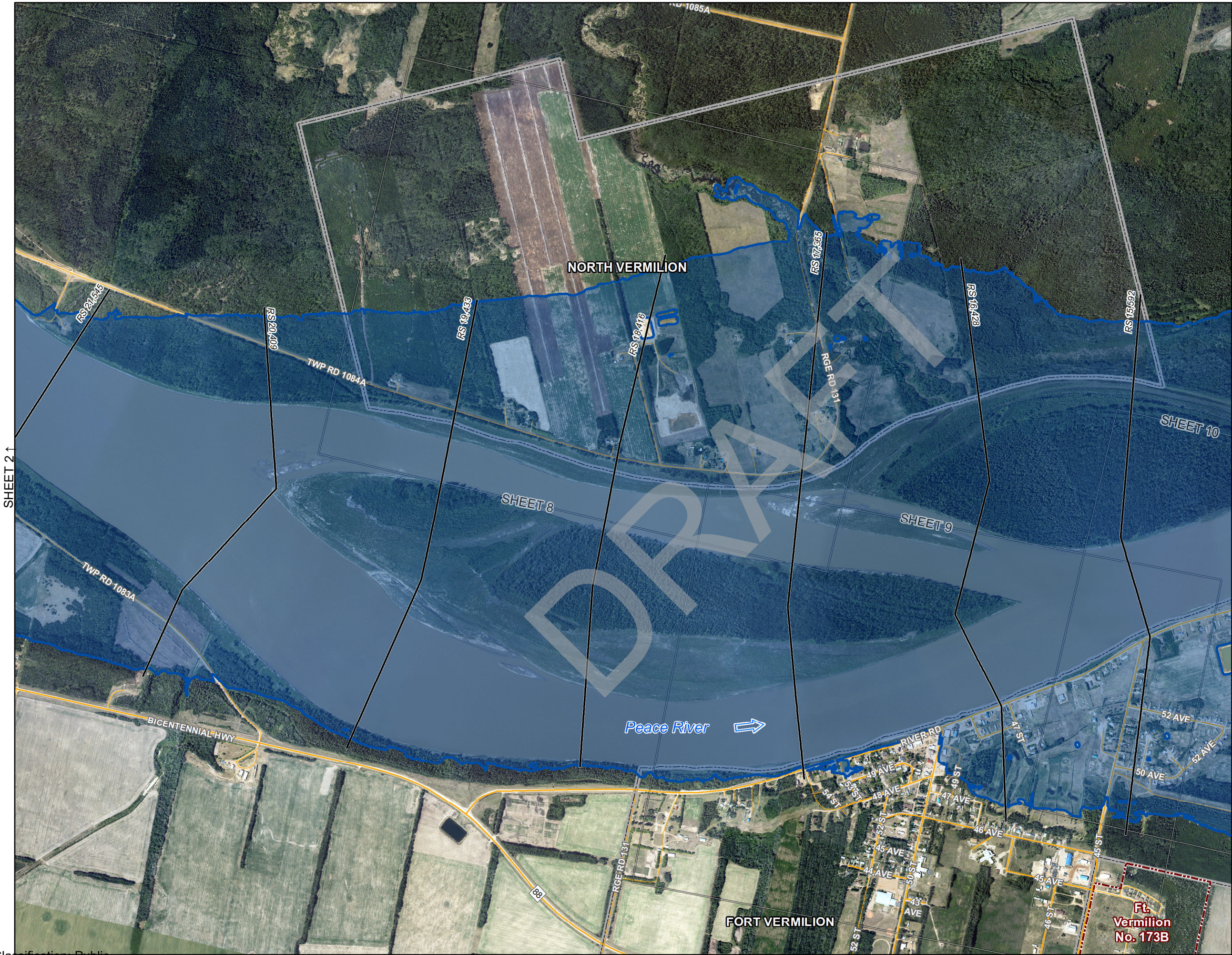


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Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

200-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 200-YEAR FLOOD INUNDATION EXTENT

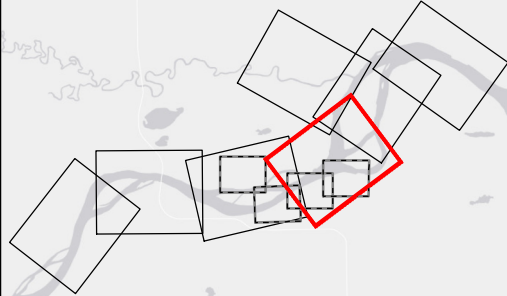
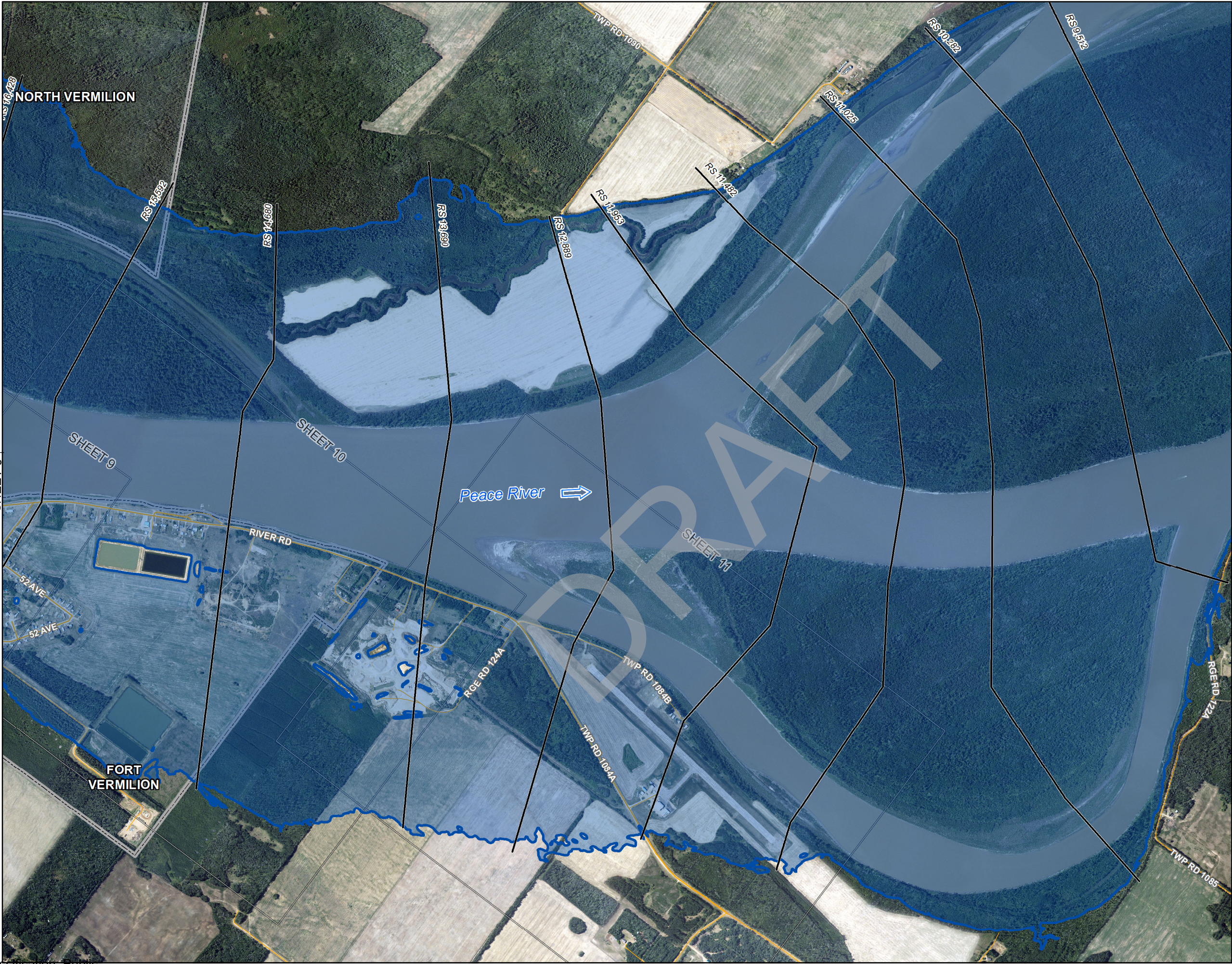
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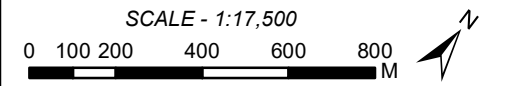
Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

200-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
- 🌉 BRIDGE
- 🚧 CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- 🔴 INDIAN RESERVE
- 🏠 MUNICIPAL BOUNDARY
- 🔵 200-YEAR FLOOD INUNDATION EXTENT

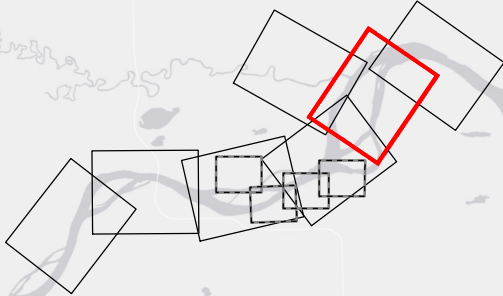
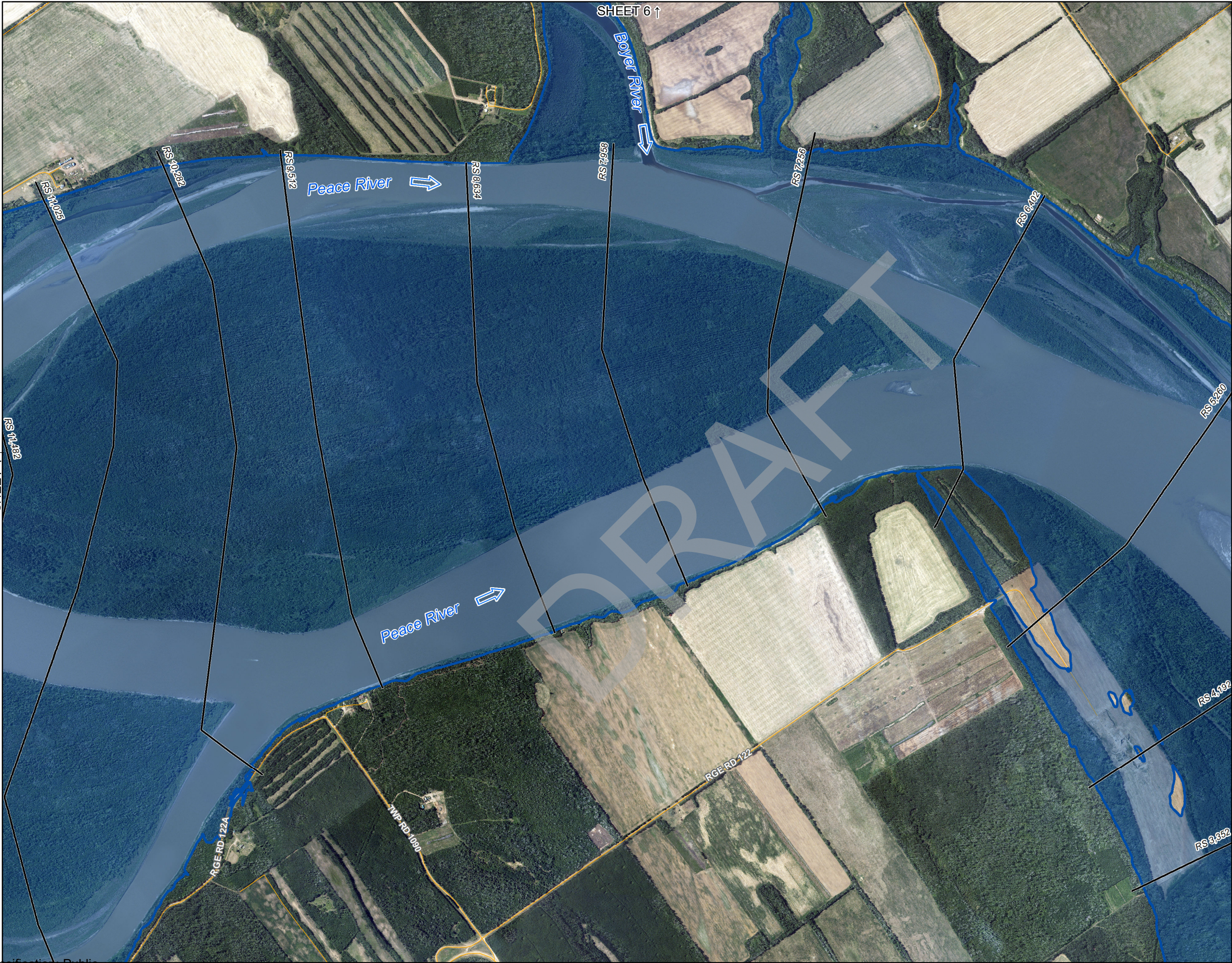


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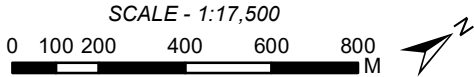
Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

200-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
- 🌉 BRIDGE
- 🚧 CULVERT
- 🛣️ LOCAL ROAD
- 🛣️ PROVINCIAL ROAD
- 📏 STUDY LIMIT
- MODEL CROSS SECTION
- 🔴 INDIAN RESERVE
- 🏠 MUNICIPAL BOUNDARY
- 🌊 200-YEAR FLOOD INUNDATION EXTENT



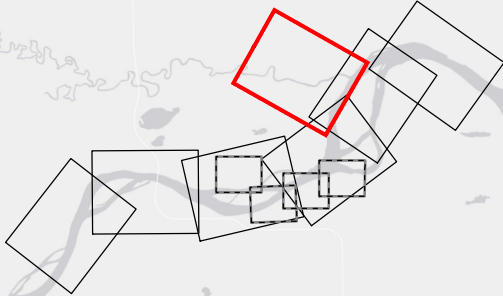
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Engineer	MGB	GIS	REH	Reviewer	DJH
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Job: 1006302	Date: 31-MAR-2021
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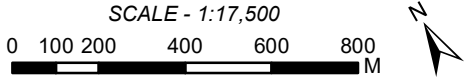
FORT VERMILION FLOOD HAZARD STUDY

200-YEAR ICE JAM
FLOOD INUNDATION MAP



- FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 200-YEAR FLOOD INUNDATION EXTENT

SHEET 5 ↓



Coordinate System: NAD 1983 CSRS 3TM 117;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

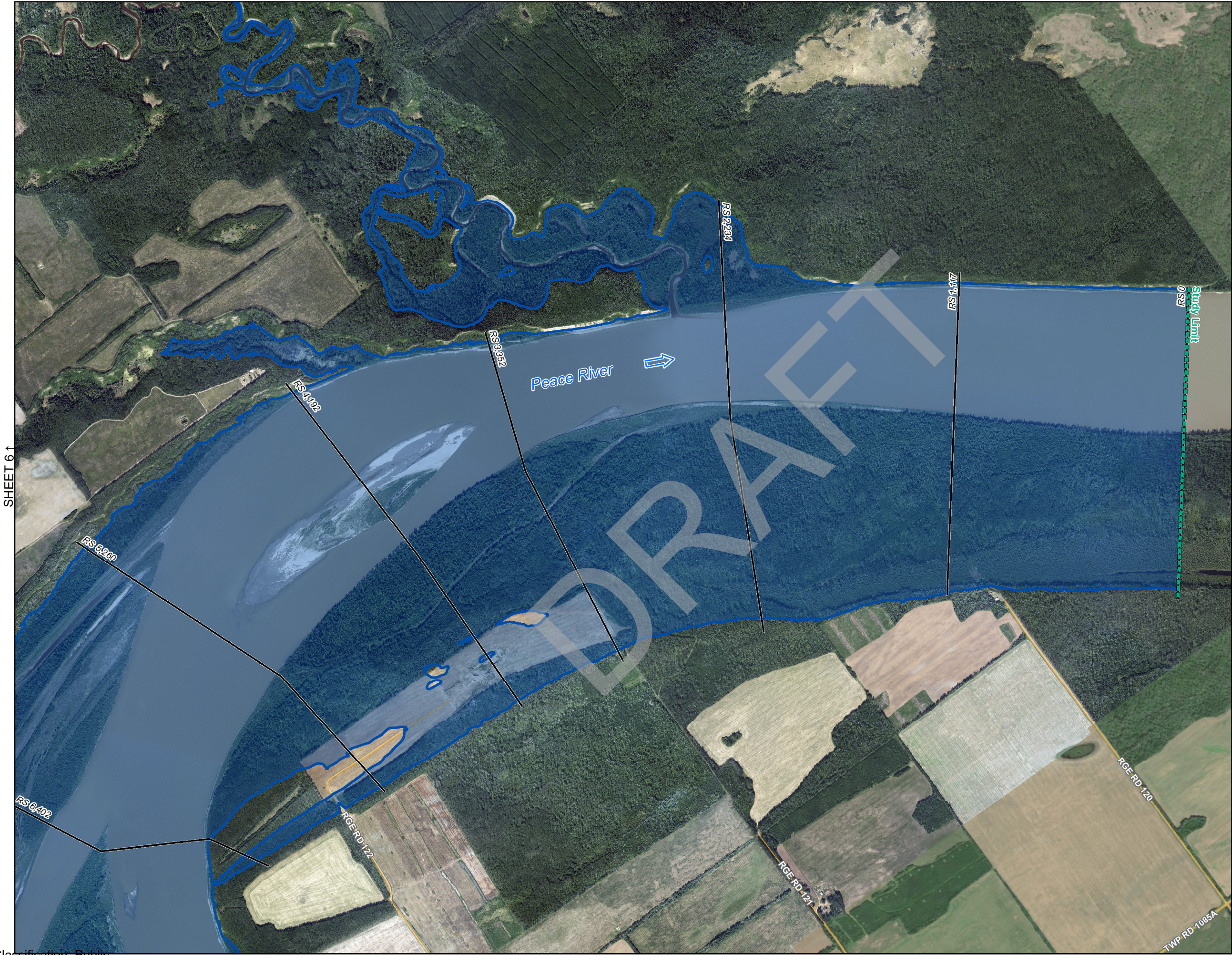
Engineer	MGB	GIS	REH	Reviewer	DJH
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Job: 1006302 Date: 31-MAR-2021

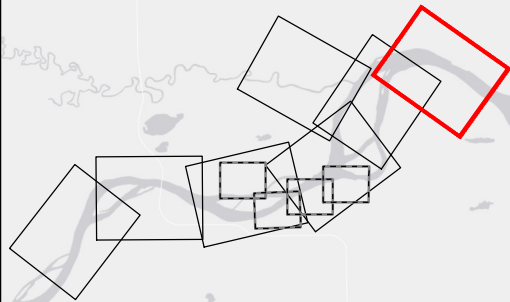
FORT VERMILION FLOOD HAZARD STUDY

200-YEAR ICE JAM
FLOOD INUNDATION MAP

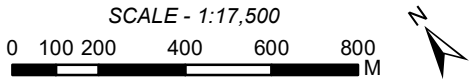
SHEET 6 OF 11



SHEET 6 ↑



- FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 200-YEAR FLOOD INUNDATION EXTENT

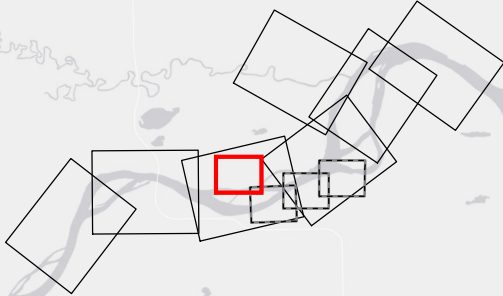
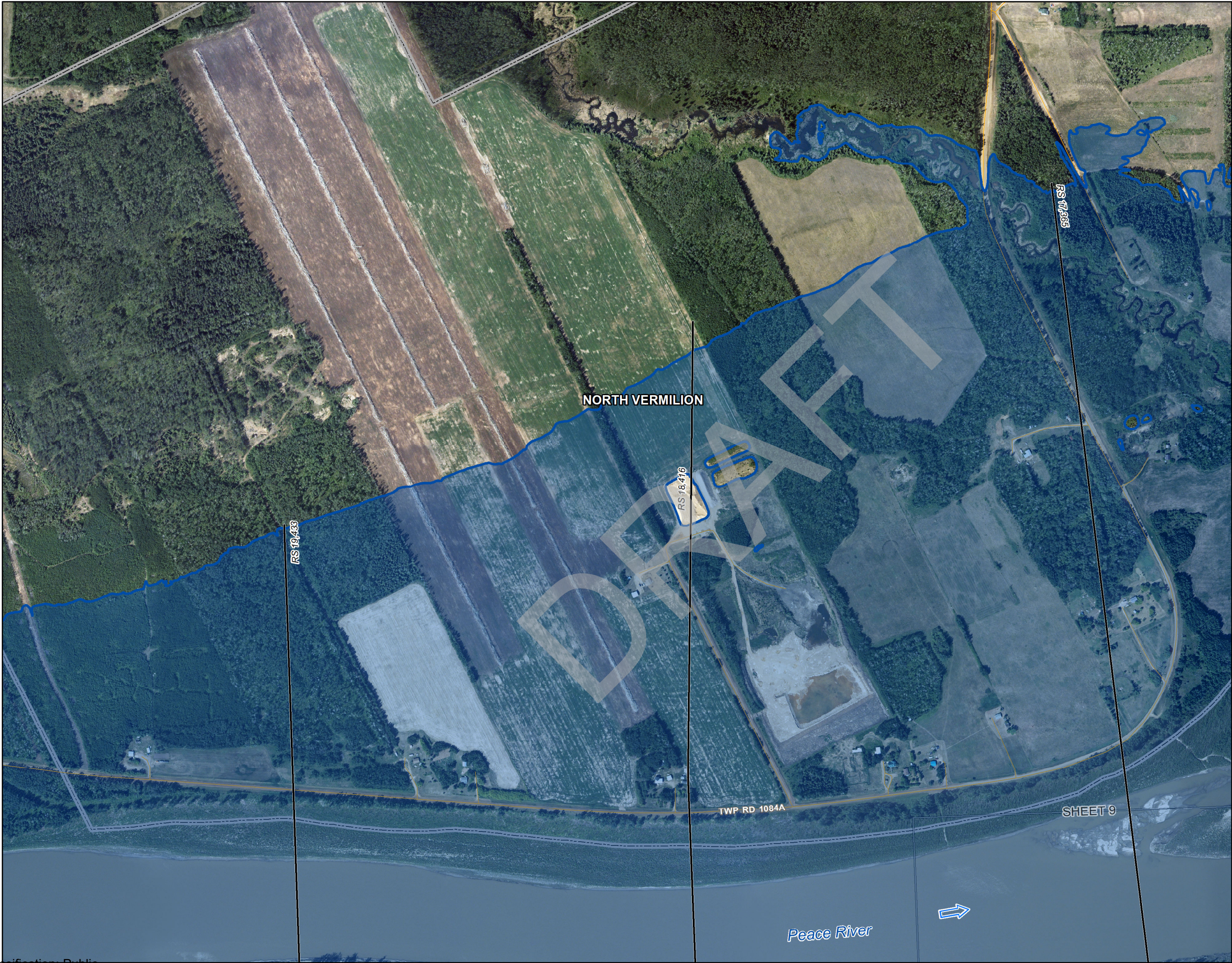


Coordinate System: NAD 1983 CSRS 3TM 117;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

200-YEAR ICE JAM
FLOOD INUNDATION MAP



- FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 200-YEAR FLOOD INUNDATION EXTENT

SCALE - 1:7,500
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Coordinate System: NAD 1983 CSRS 3TM 117;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

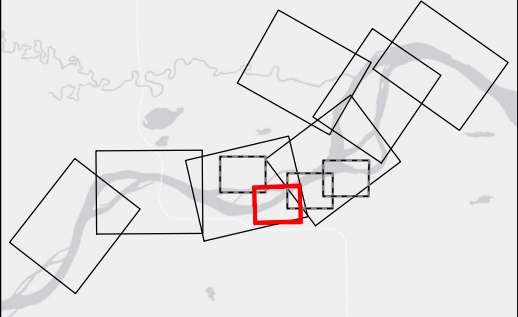
Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		


FORT VERMILION FLOOD HAZARD STUDY


200-YEAR ICE JAM
FLOOD INUNDATION MAP











 FLOW DIRECTION


 BRIDGE


 CULVERT


 LOCAL ROAD


 PROVINCIAL ROAD

 STUDY LIMIT

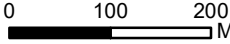
 MODEL CROSS SECTION


 INDIAN RESERVE

 MUNICIPAL BOUNDARY

 200-YEAR FLOOD INUNDATION EXTENT

SCALE - 1:7,500

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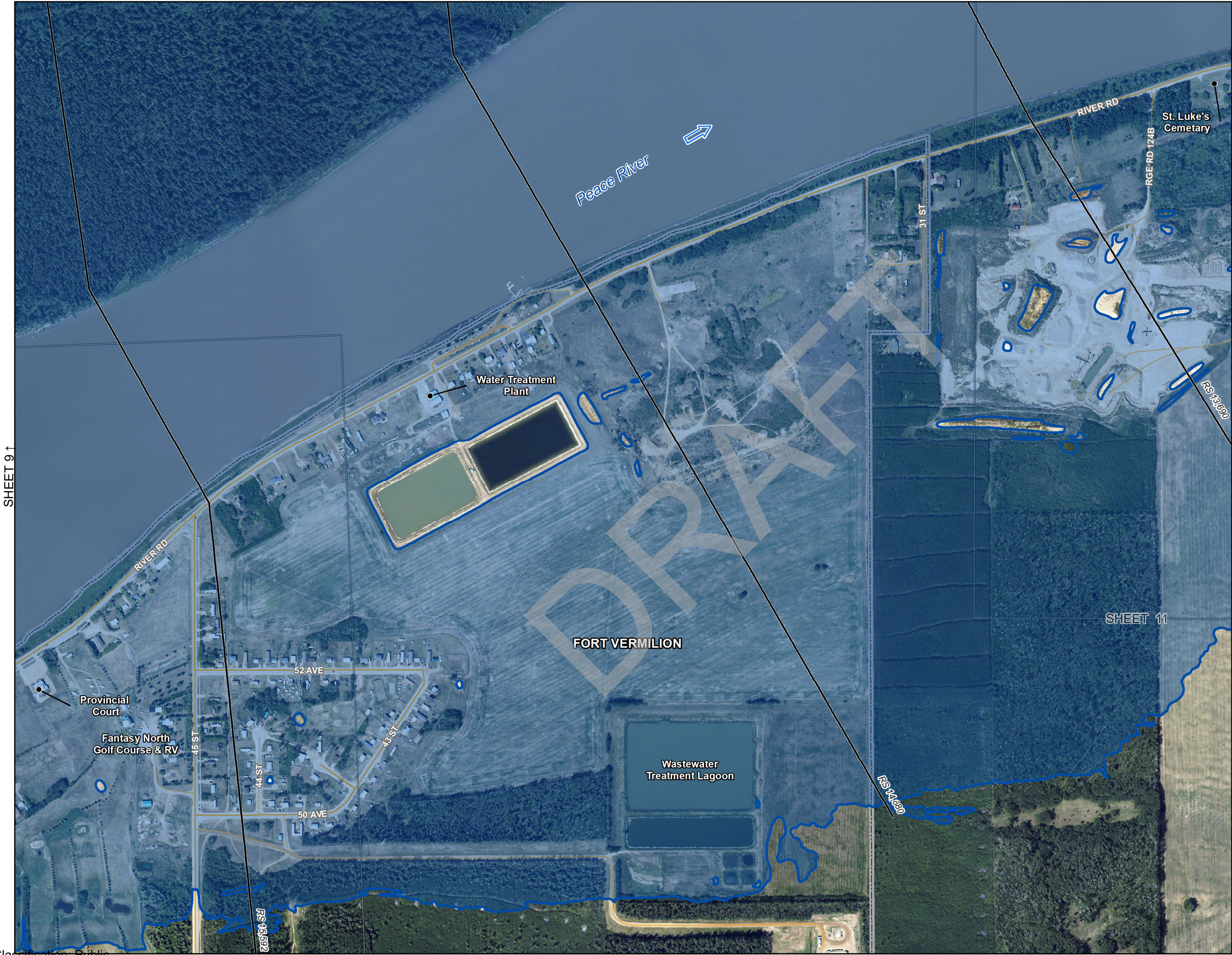
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Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

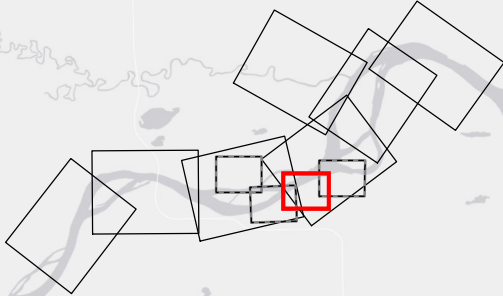
200-YEAR ICE JAM
FLOOD INUNDATION MAP

SHEET 9 OF 11

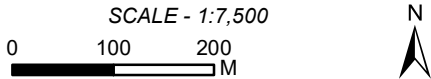


SHEET 9 ↑

↑ SHEET 11



- ➡ FLOW DIRECTION
- BRIDGE
- CULVERT
- LOCAL ROAD
- PROVINCIAL ROAD
- STUDY LIMIT
- MODEL CROSS SECTION
- INDIAN RESERVE
- MUNICIPAL BOUNDARY
- 200-YEAR FLOOD INUNDATION EXTENT

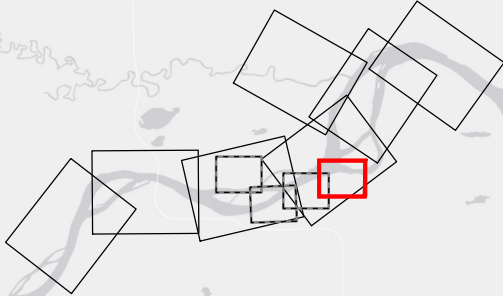


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Vertical Datum: CGVD28 HTv2.0; Units: Metres

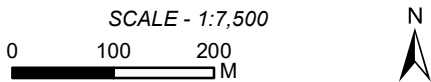
Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

200-YEAR ICE JAM
FLOOD INUNDATION MAP



- ➡ FLOW DIRECTION
- BRIDGE
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Engineer	MGB	GIS	REH	Reviewer	DJH
Job: 1006302			Date: 31-MAR-2021		

FORT VERMILION FLOOD HAZARD STUDY

200-YEAR ICE JAM
FLOOD INUNDATION MAP

