

Appendix C: Wetland Assessment Report



**WETLAND ASSESSMENT
SOUTH CANOE WIND PROJECT**

Revised: February 17, 2012



Taking Charge™



February 17, 2012

Mr. Chris Peters
Minas Basin Pulp and Power
53 Prince Street
Hantsport, NS B0P 1P0

Dear Mr. Peters,

Re: Wetland Assessment
South Canoe Wind Project

Attached is the Wetland Assessment Report prepared for the South Canoe Wind Project.

This report documents our observations, findings, and recommendations.

We trust this report to be satisfactory at this time. Once you have had an opportunity to review this correspondence, please contact us to address any questions you may have.

Thank you,

A handwritten signature in blue ink, appearing to read "MS", is positioned above the typed name and title.

Melanie Smith, MES
Environmental Specialist
msmith@strum.com

A handwritten signature in blue ink, appearing to read "AW", is positioned above the typed name and title.

Andy Walter, BSc.
Environmental Specialist
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EXECUTIVE SUMMARY

Strum Environmental completed a wetland assessment at a potential wind energy site on behalf of Minas Basin Pulp and Power in 2011. The objective of the assessment was to determine the location and extent of wetland habitat in order to support the planning stages of the wind farm development.

The scope of the study included a desktop review to determine the field survey assessment areas, completion of field surveys to identify wetlands and watercourses at the site, mapping to identify potential and actual wetland habitat and watercourses, and provision of a report detailing methodology and results.

Field assessments were completed from October to early December, 2011. Results are as follows:

- Multiple wetlands and watercourses were identified across 22 field assessment study areas.
- A total of 34 wetlands and 21 watercourses were identified adjacent to existing access roads. A preliminary characterization of each wetland delineated, and watercourses within a 30 m corridor of existing roads, was completed.

Based on the survey results, the following recommendations are provided:

1. Once finalized, a detailed assessment for wetland habitat and watercourses should be completed for the access roads and turbine pad footprints. Delineation of wetland boundaries within these locations should be completed in the growing season (June 1 - September 30).
2. Appropriate hydrology and wetland buffers should be applied to all wetlands and watercourses identified in this assessment.

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1.0 INTRODUCTION

Strum Environmental completed a wetland assessment at a potential wind energy site on behalf of Minas Basin Pulp and Power (MBPP) from October to December, 2011. The objective of the assessment was to determine the location and extent of wetland habitat in order to support the planning stages of the wind farm development.

Since completion of the 2011 wetland field assessment, the preliminary road layout and Project boundaries have been updated as part of the site optimization process. Results as they pertain to the Project Area (i.e. area of land incorporating the turbines and access roads), are discussed within the Environmental Assessment Registration Document (see Section 4.4.1).

2.0 SITE DETAILS

Oxford Frozen Foods, MBPP, and Nova Scotia Power Inc. (NSPI) have proposed the development of a 100 MW wind generation facility in Central Nova Scotia between the Municipalities of the District of West Hants and the District of Chester (the Project). The Project site is near the settlement of Leminster, approximately 25 km southwest of Windsor, Nova Scotia, on approximately 6,369 ha of land. The site consists of a mix of hardwood forest (some logged), shrubby barren, mixed forest, and coniferous forest (some logged). The Project will include between 34 and 50 wind turbine generators, depending upon the model chosen.

3.0 PROJECT SCOPE

In order to achieve the Project objective, the following tasks were completed:

- preliminary desktop assessment of the site, including a review of available background material and identification of specific field assessment study areas (hereafter referred to as study areas);
- field surveys to identify wetland habitat, watercourse locations, and other useful information;
- mapping to identify potential and actual wetland habitat and watercourses; and
- provision of a report detailing methodology and results.

4.0 METHODOLOGY

Assessment methodology is detailed in the sections that follow.

Task 1: Development of Study Areas

A mapping layer was developed for the site that identified areas that had a high potential for wetland habitat. This was achieved by reviewing the following available local databases, maps, and aerial photos:

- NS Department of Natural Resources (NSDNR) Significant Species and Habitat Database;
- NSDNR Wet Areas Mapping (WAM);
- Topographic Mapping;
- Current aerial photos; and
- Nova Scotia Geomatics Centre.

This information was incorporated with the preliminary access road layout within the 'Property Boundary provided by the Client, and resulted in 22 study areas [Drawing 1 (Appendix A)].

Task 2: Conduct Wetland Surveys

All study areas were systematically surveyed by a team of two wetland delineators to confirm the presence and extent of wetland habitat and location of watercourses.

Strategic linear transects were designed to intercept preliminary roads and wind turbine locations wherever possible within each study area. In addition, a more detailed field assessment, using more frequent transects, was completed in close vicinity to preliminary road and turbine locations, while a broader level of assessment was completed for remaining portions of the study areas. A track was recorded on a Garmin 78s GPS receiver capable of sub 5 m accuracy. Waypoints were recorded at preliminary wetland boundaries and watercourse locations when encountered in the field.

Assessment strategies included:

- Wetland habitat and approximate boundaries: Where wetland habitat extended over a large area, investigational transects were routed to identify the outer extent of the habitat. In the event that wetland habitat was consistent throughout large extents of the study area (based on field observations and desktop information), a high likelihood of wetland habitat was assumed in those areas and no further field assessment was completed. Smaller areas of wetland habitat were defined using individual waypoints to identify the outer edges of the wetland habitat.
- Access Roads: Areas of wetland habitat existing within a 30 m easement adjacent to existing proposed roads were delineated and field flagged with pink flagging tape marked 'wetland delineation'. A preliminary characterization of each wetland was also completed (Table B1, Appendix B).
- Watercourse locations: Watercourses located within study areas were identified by a single GPS point, as encountered. The flow direction of the watercourse was indicated; however, the route was not tracked in the field. Where a watercourse exists alongside or below an existing road, a general characterization of the watercourse was completed (Table B2, Appendix B).

Wetland Habitat Determination

In order for a wetland determination to be made, the field team evaluated site conditions to determine if the following three criteria were met:

1. Presence of hydrophytic (water loving) vegetation;
2. Presence of hydrologic conditions that result in periods of flooding, ponding, or saturation during the growing season; and
3. Presence of hydric soils (anaerobic conditions in upper part) (US Corps of Engineers, 1987).

Although detailed data point analysis was not completed within the study areas, soil pits were completed frequently to confirm the presence/absence of wetland hydrology and hydric soils. In addition, a general vegetation survey was completed to confirm the presence/absence of hydrophytic vegetation.

Detailed wetland delineation identification methodologies are attached as Appendix C.

Task 3: Deliverables

The deliverables for this Project include the provision of this report, describing the assessment methodology and results, as well as mapping displaying field identified wetlands and watercourses (refer to Section 5.0).

5.0 RESULTS

Wetland habitat and watercourses identified within the study areas, and alongside existing access roads at the site, are described in the following sections:

5.1 Mapping

A series of maps were prepared to present the findings of the assessments (Table 1).

Table 1: Mapping Results

Drawing Title and Description	Drawing #
Study Area Locations - high potential areas for wetlands and study area locations.	Drawing #1
Assessment Results - field observed and approximate wetland boundaries and watercourse locations are presented for each study area and adjacent to existing proposed roads.	Drawing #'s 2A-V

The following points should be noted:

- Drawings 2A-V show the results of the field surveys and identify preliminary wetland boundaries and watercourse locations¹. In addition, areas within each study area expected to have a high likelihood of wetland habitat, based on a review of background material and field observations, have also been identified.

¹ Setback buffers have not been applied to watercourses and wetland habitat.

- Waypoints were typically recorded in intervals ranging between 10-30 m apart. In cases where extensive wetland habitat exists, waypoint intervals were up to 60 m apart.
- Approximate wetland boundaries were identified using a combination of field observations and desktop resources. Desktop resources used for approximating wetland boundaries were the NSDNR WAM, NSDNR Significant Species and Habitat Database, and the Nova Scotia Geomatics Centre data.
- Drawings 2 A-V also show defined wetland boundaries and watercourse locations which exist adjacent to, or drain below, existing access roads on the site. A 30 m corridor was assessed.
- Where wetland habitat was observed to extend beyond the assessment areas, the indication line is absent. Typical waypoint intervals within the 30 m corridor are 5 m apart.

The assessment identified multiple wetlands and watercourses across the study areas and adjacent to existing access roads. A preliminary characterization of each wetland delineated within a 30 m corridor of existing roads is provided in Table B1 (Appendix B). Basic characterizations for watercourses running adjacent to, or below, existing roads are provided in Table B2 (Appendix B).

A photograph log for the defined wetlands and watercourses located adjacent to existing access roads is included as Appendix D.

A glossary of terms used to describe this site is also attached as Appendix E.

5.2 Discussion

Wetland habitat is relatively interspersed throughout the site and predominantly consists of treed swamps (and former treed swamps in clear cuts). The majority of the on-site wetlands function as outflow or seepage, basin type swamps which drain water from higher land and seep into lower lying watercourse systems and lakes, via drainage channels or seepage wetlands. Study area descriptions are provided below:

- **Study Area 1** – Northern portions of Study Area 1 consist of numerous small basin swamps and drainage areas located in clear cut areas. Water drains via a larger outflow shrub swamp in central portions, and a narrow seepage swamp bordering the western site boundary to the south, where water is collected in a lower lying, large treed swamp. General water movement is north to south. A proposed access road exists to the north and along the eastern boundary of Study Area 1. A 30 m easement area was surveyed along this road and defined wetland boundaries were established.
- **Study Area 2** – In the western portion of Study Area 2, narrow seepage swamps exist in areas of clear cut, and drain water from south to north. A narrow portion of high land

divides the western and eastern areas of wetland habitat and provides more suitable areas of land for wind turbine placement. Sloped, drainage shrub swamps exist in eastern portions, which drain water from west to east toward lower lying, swamp habitat beyond the eastern boundary.

- **Study Area 3** – Study Area 3 is predominantly high and dry land with one small area of treed swamp habitat in close proximity to a proposed turbine location in the southern portions. Three areas of wetland habitat were identified along the existing road which bisects central portions of the study area. Wetland conditions were observed to extend to the east of the access road (wetlands 30, 31, and 32) and to the west of the access road (wetland 32).
- **Study Area 4** – Study Area 4 is interspersed with a mixture of small basin swamps on higher land, and linear outflow seepage swamps which drain water from west to east. A lower lying treed swamp exists adjacent to the existing access road (South Canoe Lake Road) and supplies water to numerous associated watercourses and wetlands. A 30 m easement was also surveyed along South Canoe Lake Road and defined wetland boundaries were established.
- **Study Area 5** – Two large linear, seepage, outflow treed and shrub swamps exist in Study Area 5. The first swamp borders South Canoe Lake Road and drains water to the south, into a roadside ditch. The second swamp exists in the central portions and intercepts drainage from bordering higher land to the east and west, before draining off-site to the south. In the north, a lentic shrub swamp drains water to the north and into an off-site lake. Two small basin swamps and some drainage features exist in western portions of the study area. A 30 m easement was also surveyed along South Canoe Lake Road and defined wetland boundaries were established.
- **Study Area 6** – General water flow in Study Area 6 is from north to south via a large former outflow treed swamp, which has since been clear cut. As well, in northeastern portions an additional former treed swamp drains water off-site to the north. Land to the west of the existing access road is relatively dry, consisting only of three basin shrub swamps. The driest land is on high land in the eastern third of the study area.
- **Study Area 7** – Study Area 7 is dominated by a large treed swamp that extends from wetland habitat located to the north in Study Area 6. Water drains from the wetland via a watercourse and drainage toward South Canoe Lake to the west. In eastern portions, narrow seepage wetlands drain water from northeast to southwest. The driest areas exist in the southeastern and southwestern extremities of the study area.
- **Study Area 8** – In western portions of this study area, two outflow treed swamps drain water west towards South Canoe Lake. The eastern half of the study area is dominated by small basin swamps located on higher land in the northeast, and linear seepage swamps, which intercept water from wetland habitat in Study Area 7 and drain from north to south. Areas of drainage and a watercourse exist near the eastern study area boundary.
- **Study Area 9** - Study Area 9 includes narrow seepage treed swamps and small basin treed swamps, which drain water from north to south toward Big Otter Lake. A watercourse and associated riparian wetland habitat exist in eastern portions and also drain into the lake.

- **Study Area 10** – Narrow swamps, watercourses, and areas of drainage dominate the central portions of Study Area 10 and drain water from north to south. A larger area of swamp habitat near the eastern boundary drains water toward Big Otter Lake (off-site). Land is relatively dry in the southern and northeastern portions of Study Area 10. Although not specifically observed in the field, it is anticipated that the watercourses identified in northern portions are hydrologically connected to wetland habitat and other watercourses observed in Study Area 8.
- **Study Area 11** – Northern portions of Study Area 11 provide high, dry land. Central portions consist of a throughflow treed swamp which drains water from west to east towards Mud Lake. At the southeastern corner of the study area, a large lentic fen exists and likely extends off-site and borders the eastern shore of Mud Lake (also located off-site).
- **Study Area 12** – In northern portions of Study Area 12, to the east of the proposed road, numerous areas of narrow outflow treed swamps drain from west to east providing water to a large area of swamp habitat located beyond the eastern study area boundary. A lotic fen extending from Study Area 11 dominates the northern corner of the study area. In the southern portion of the study area, general water flow is south to north via narrow seepage wetlands and a watercourse, which bisect the proposed road location. South of the proposed road, treed swamp habitat drains water off-site beyond the southern study area boundary.
- **Study Areas 13, 14 and 15** – Wetland type within these three study areas is dominated by small, topographically defined basin treed swamps. There are also multiple areas of larger swamp habitat which either bisect the proposed roads, or initiate from the proposed road and extend to the east or west. The smaller basin wetlands are mostly fed by localized surface run-off and areas of drainage. The larger throughflow swamps are low lying features associated with drainage via watercourses and wetlands to or from Card Lake located off-site to the east.
- **Study Area 16** – The majority of Study Area 16 has been clear cut and consists of multiple narrow seepage swamps in eastern portions, and isolated basin swamps on flatter land in the western third of the study area. General flow of water through all wetlands is west to east, although at the northwestern extremity of the study area, water drains via narrow wetland habitat off-site to the northwest.
- **Study Area 17** – Northern and southern portions of Study Area 17 are dominated by moderate sized outflow treed swamps, with some isolated basin treed swamps also identified. A large treed swamp exists in central portions of the study area and drains water from west to east, exiting via an off-site watercourse, located beyond the eastern boundary. In northern portions, wetlands to the west of the proposed road drain water off-site to the west via narrow seepage wetlands. Wetland habitat located east of the proposed road exists as narrow linear basins and drain to the north (northern most wetland) and to the southeast (adjacent wetland). In southern portions, treed and shrub swamp habitat dominates low lying land bordering the western boundary and extends off-site. The driest portions of land exist in the northern and southern extremities of the study area, although the northern portion of the study area includes multiple watercourses and areas of drainage. A proposed access road exists to the

west of Study Area 17. In this area, a 30 m easement was surveyed, and defined wetland boundaries were established.

- **Study Area 18** – Water drains through Study Area 18 from south to north toward Dam Bay primarily via shrub swamp habitat and two watercourses. In southern portions of the study area, water also drains from a large beaver pond via narrow wetland habitat off-site to the southwest. Eastern portions are dominated by multiple small bogs located on slightly higher, barren land.
- **Study Area 19** – Water drains via narrow, linear treed swamps and former treed swamps (clear cut) from south to north through Study Area 19. Water is sourced from surface run-off and seepage, in addition to extensive wetland habitat and/or a watercourse located east of Highway 14. The northeastern extremity of the study area consists of mix wood forest located on high, dry land.
- **Study Area 20** – Study Area 20 is predominantly dry apart from two watercourses which drain water from Joe Long Lake to Bog Lake and two small areas of treed swamp habitat.
- **Study Area 21** – Water generally drains from higher land in the north via watercourses and wetland habitat to and then from Joe Long Lake located in central portions of the study area. In southern regions, a linear outflow treed swamp drains water from south to northwest. In lower lying land adjacent to the Wile Settlement Road, additional treed and shrub swamps drain off-site to the south. Generally speaking, the western third of Study Area 21 provides the driest land.
- **Study Area 22** – Central areas of Study Area 22 offer the highest, driest land suitable for wind turbine placement. Wetland habitat (marsh) borders Card Lake at the southern extremity of the study area. A basin throughflow shrub swamp exists in northern portions, in addition to a small swamp located adjacent to the existing access road. A proposed access road exists to the east of Study Area 22. In this area, a 30 m easement was surveyed, and defined wetland boundaries were established.

6.0 RECOMMENDATIONS

1. Once finalized, a detailed assessment for wetland habitat and watercourses should be completed for the access roads and turbine pad footprints. Delineation of wetland boundaries within these locations should be completed in the growing season (June 1 - September 30).
2. Appropriate hydrology and wetland buffers should be applied to all wetlands and watercourses identified in this assessment.

It should also be noted that development or infilling of wetland habitat associated with wind turbine locations, and/or construction of access roads, and any alteration of watercourses, will require provincial permitting approvals.

7.0 CLOSURE

This report has been completed for the sole benefit of MBPP. Any other person or entity may not rely on this report without the express written consent of Strum Environmental and MBPP.

The conclusions presented in this report represent the best judgement of the assessor based on the current environmental standards. The assessor is unable to certify against undiscovered environmental liabilities due to the nature of the investigation and the limited data available.

This report was prepared from information collected during site visits undertaken from October to December 2011. The results in this report rely only on the conditions identified at this time.

Should additional information become available, Strum requests that this information be brought to our attention immediately so that we can re-assess the conclusions presented in this report. This report was prepared by Andy Walter, Environmental Specialist and reviewed by Melanie Smith, Environmental Specialist. Senior review was completed by Carys Burgess, Senior Environmental Specialist.

8.0 REFERENCES

Corps of Engineers Wetlands Delineation Manual, US Army Corp of Engineers, 1987.

APPENDIX A
SITE DIAGRAMS

Notes:

1. Reference: Nova Scotia Property Records. 1:10,000 digital topographic mapping, property management units MU9902 and 9937 by Nova Scotia Geomatics Centre.

2. Projection: NAD83(CSRS), UTM Zone 20 North.

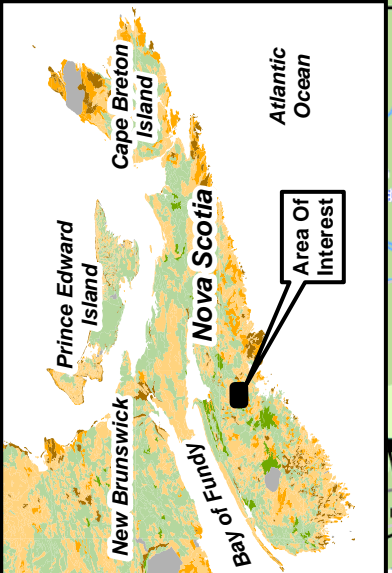
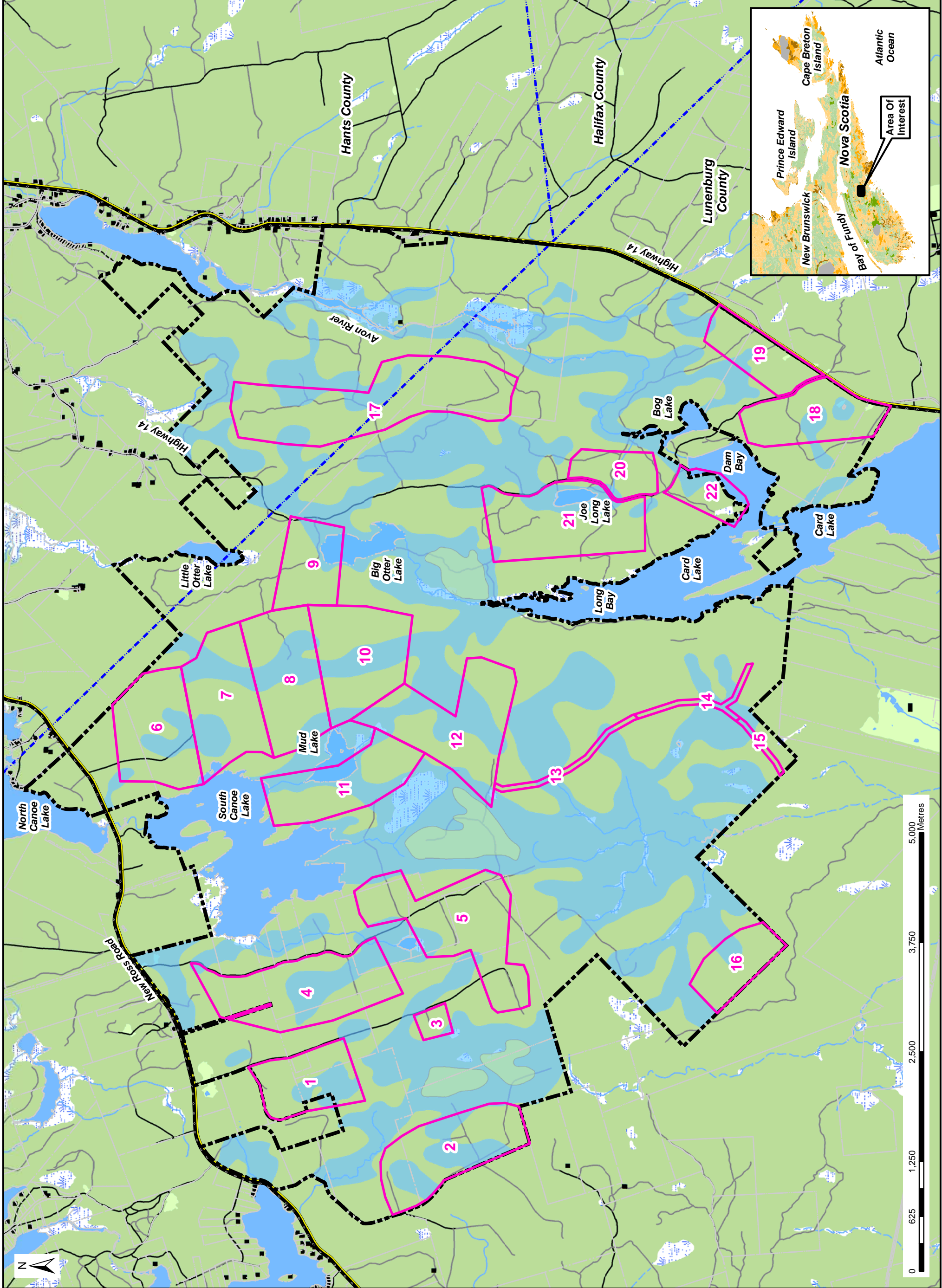
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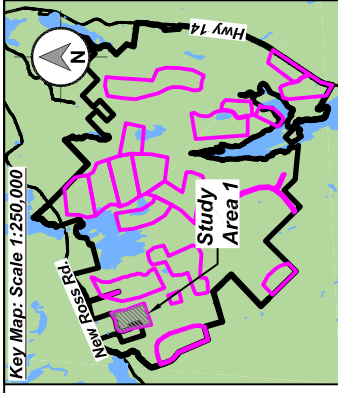
- Buildings
- Study Areas
- Site Boundaries
- Adjacent Properties
- County Boundaries
- Existing Major Roads
- Existing Roads
- Existing Access Roads / Trails
- Mapped Stream
- Mapped Indefinite Stream
- Water Bodies
- Mapped Swamp
- Cleared Area
- Potential Wetland Areas

Study Area Locations



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Drawn By:	H. Serhan		
Checked By:	A. Walter		





Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

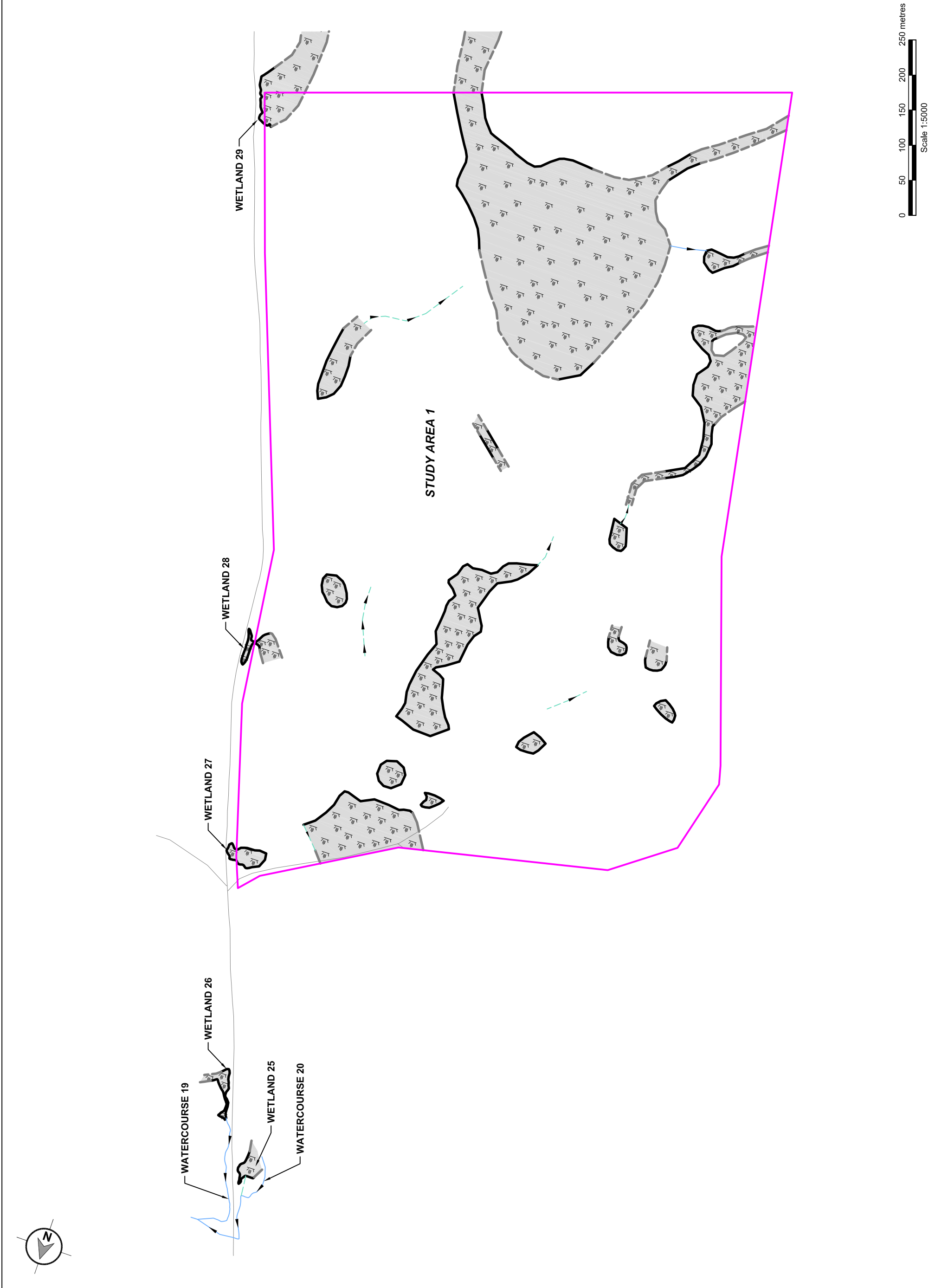
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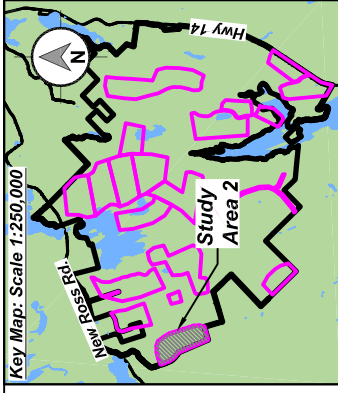
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	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Wetland Boundary (Field Observed)
	Wetland Boundary (Approximate)

Assessment Results - Study Area 1



DATE:	Jan. 2012	PROJECT #:	11-4140
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DRAWN BY:	H. Serhan	CHECKED BY:	A. Walter
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Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

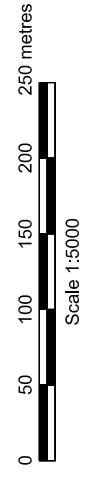
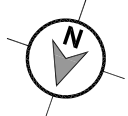
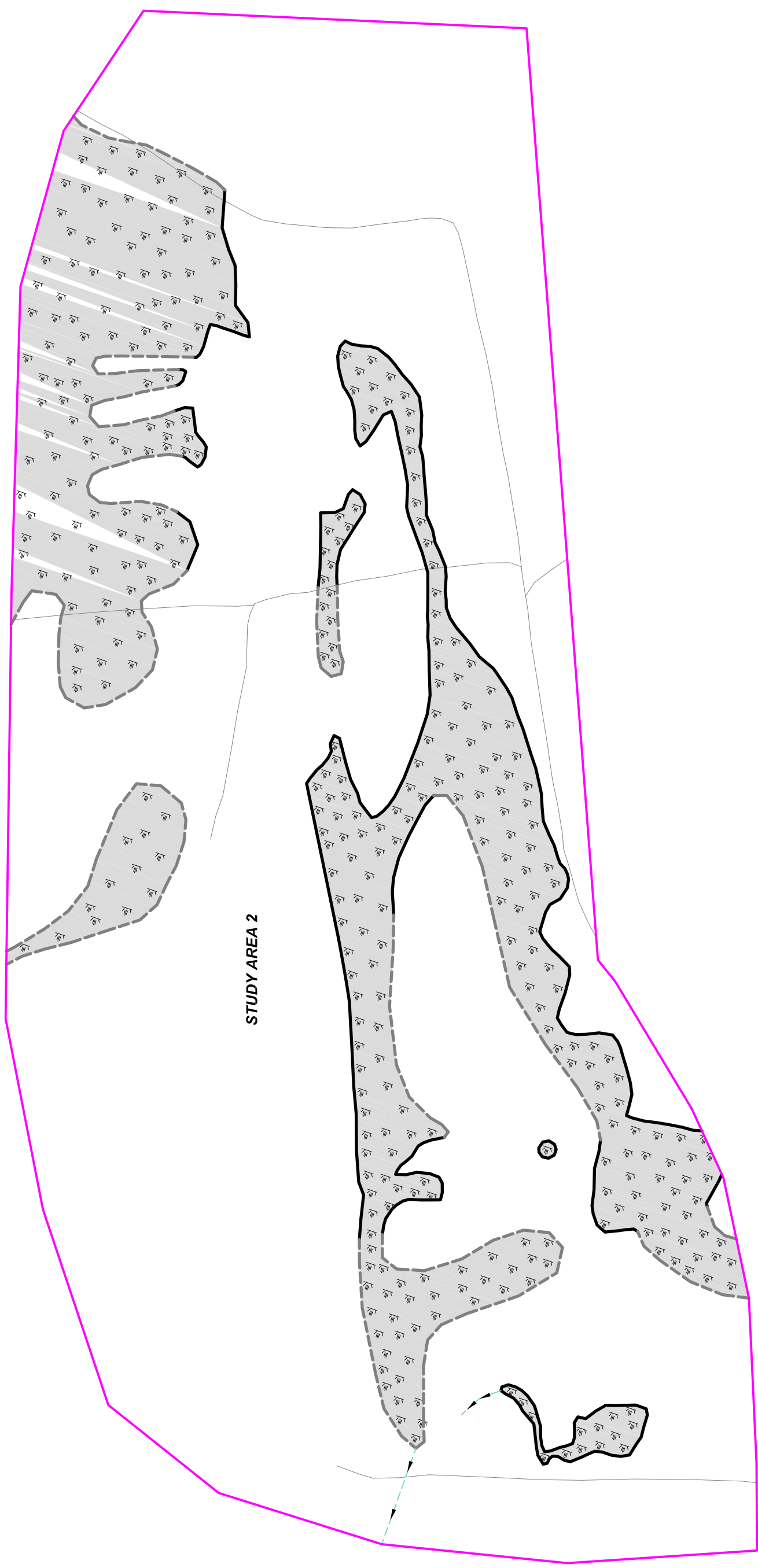
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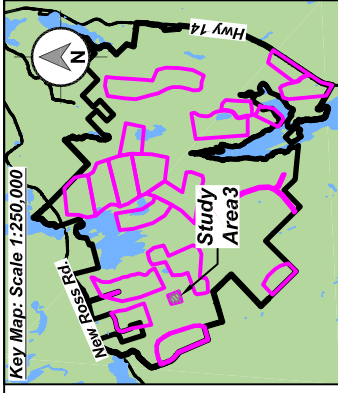
	Study Area
	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Field Identified Drainage
	Weiland Boundary (Field Observed)
	Weiland Boundary (Approximate)

Assessment Results - Study Area 2



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			2B





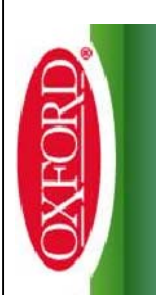
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1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

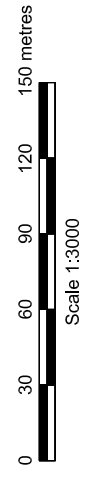
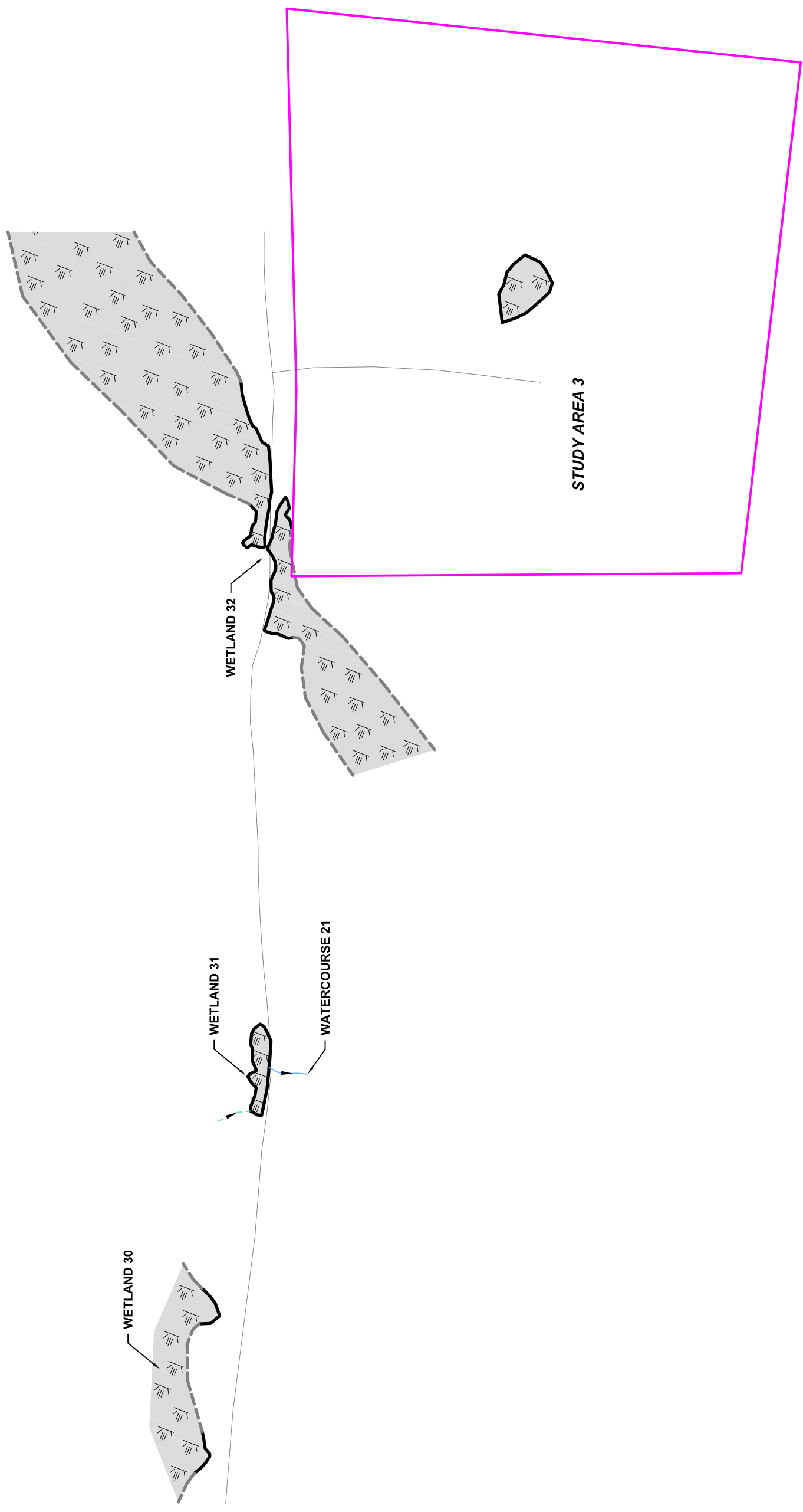
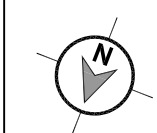
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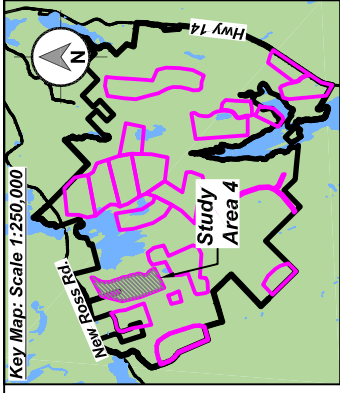
Study Area
Proposed Road
Existing Paved Road
Existing Trail / Access Road
Mapped Stream	.....
Mapped Indefinite Stream	.....
Mapped Water Bodies	.....
Field Identified Watercourse	.....
Field Identified Drainage	.....
Wetland Boundary (Field Observed)
Wetland Boundary (Approximate)

Assessment Results - Study Area 3



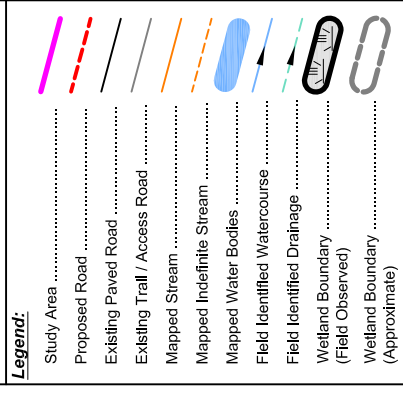
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DRAWN BY:	H. Serhan	2C	
CHECKED BY:	A. Walter		





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- Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
- Projection: NAD83(CSRS), UTM Zone 20 North.

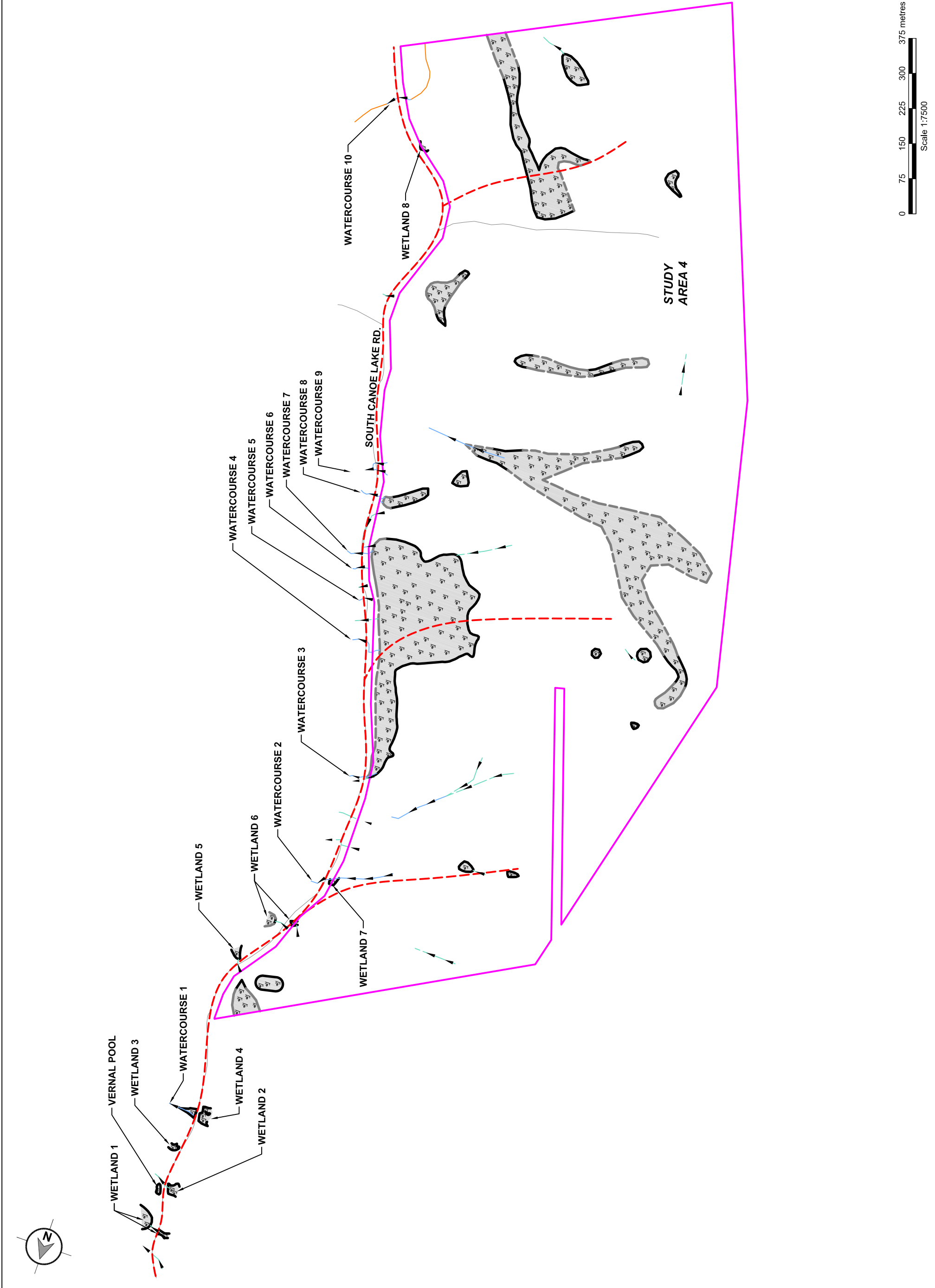


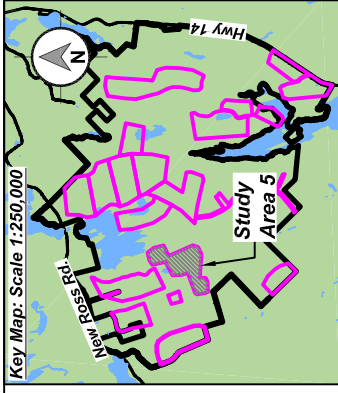
Assessment Results - Study Area 4



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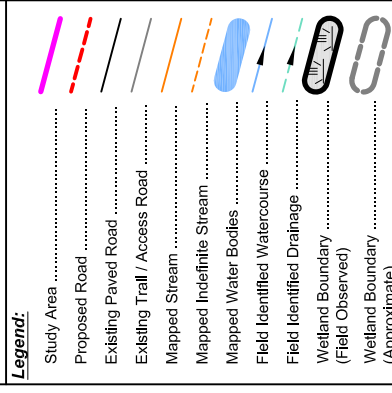
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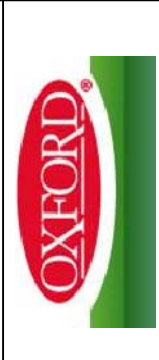


Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.



**Assessment Results -
Study Area 5**



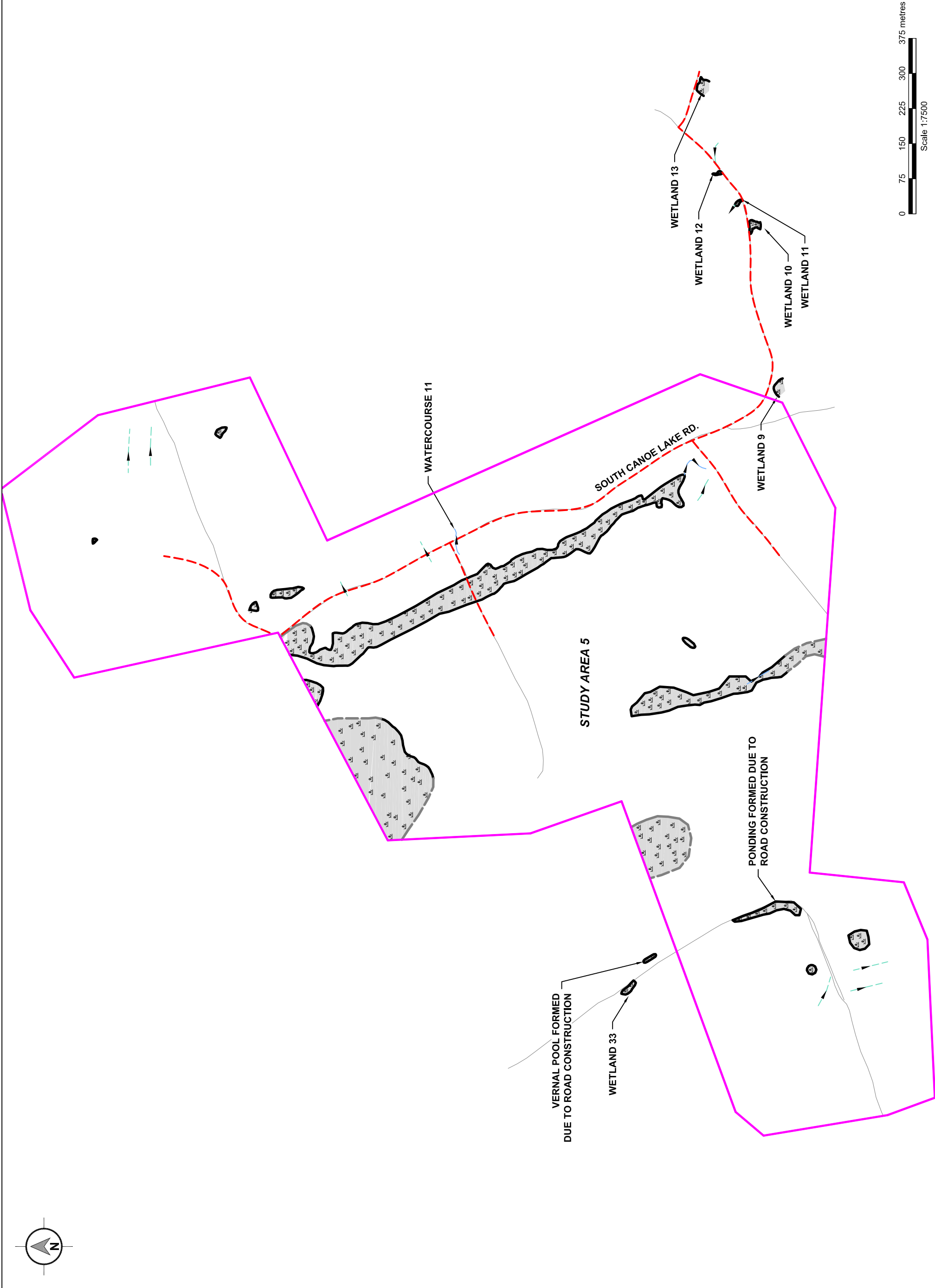
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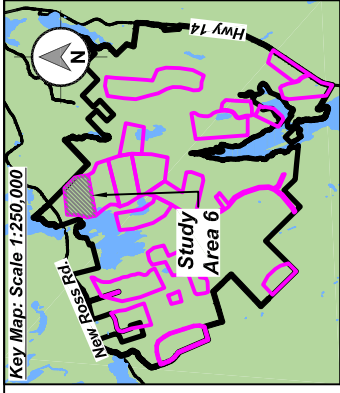
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DRAWN BY: H. Serhan

CHECKED BY: A. Walter

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Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

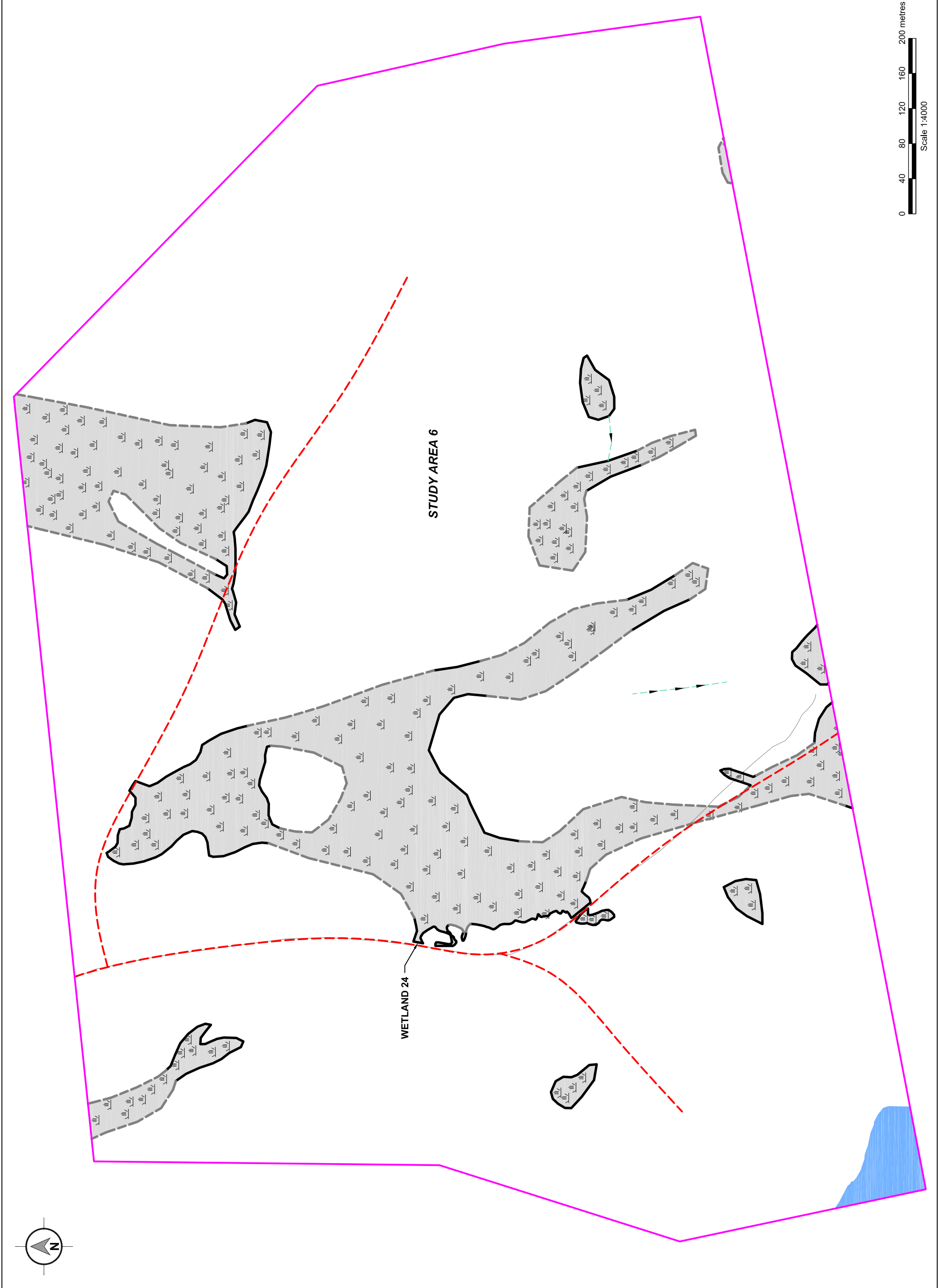
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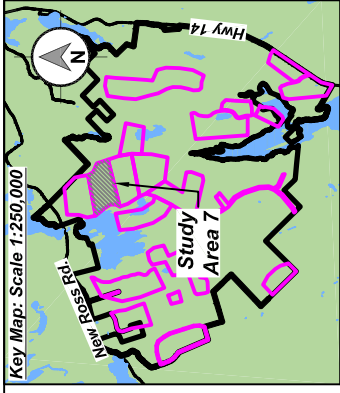
Study Area
Proposed Road
Existing Paved Road
Existing Trail / Access Road
Mapped Stream	.....
Mapped Indefinite Stream	.....
Mapped Water Bodies	.....
Field Identified Watercourse	.....
Field Identified Drainage	.....
Wetland Boundary (Field Observed)	.....
Wetland Boundary (Approximate)	.....

Assessment Results - Study Area 6



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:4000	DRAWING #:	
DRAWN BY:	H. Serhan	2F	
CHECKED BY:	A. Walter		





Notes:

- Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
- Projection: NAD83(CSRS), UTM Zone 20 North.

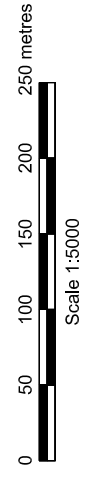
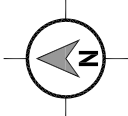
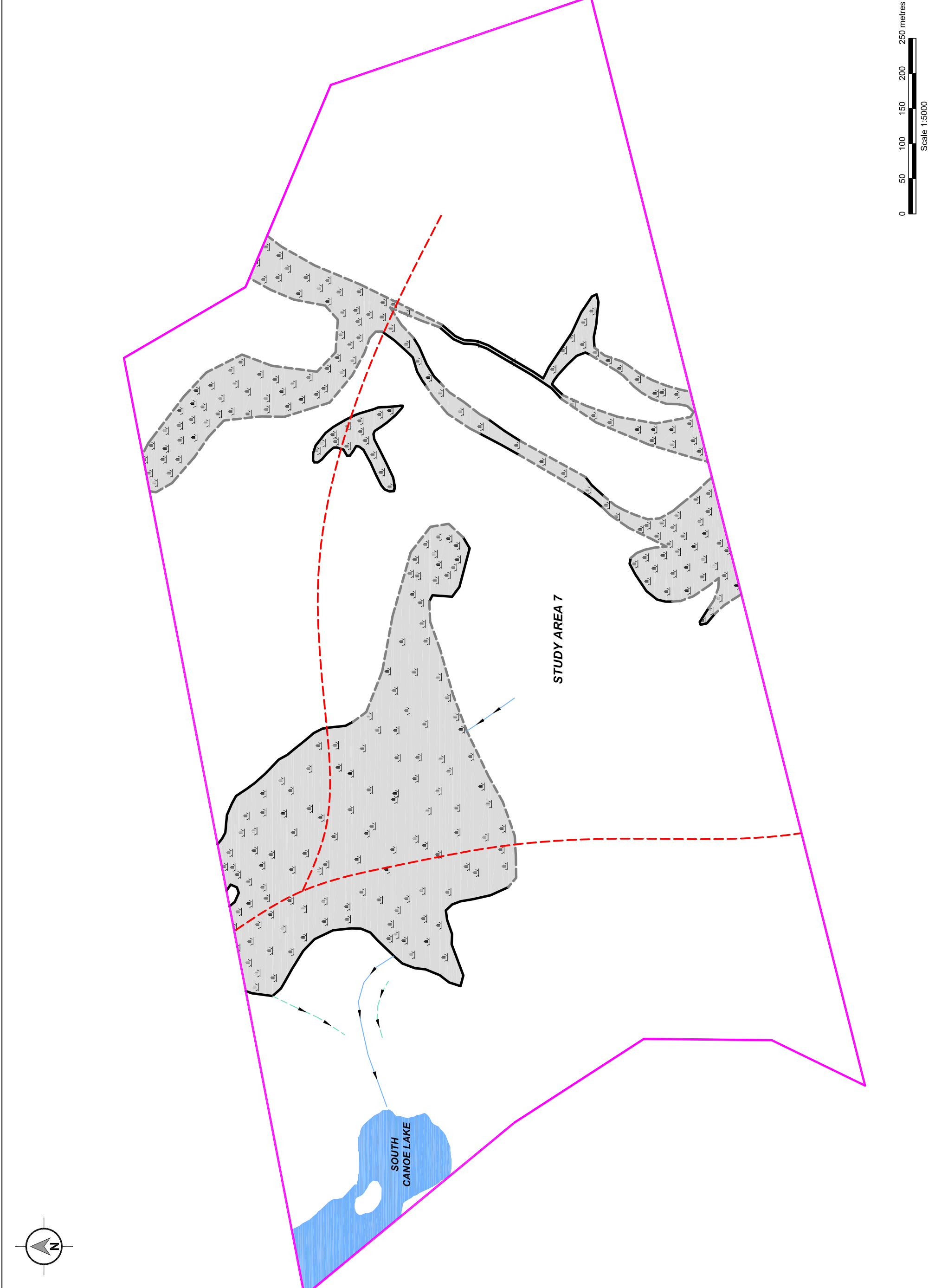
Legend:

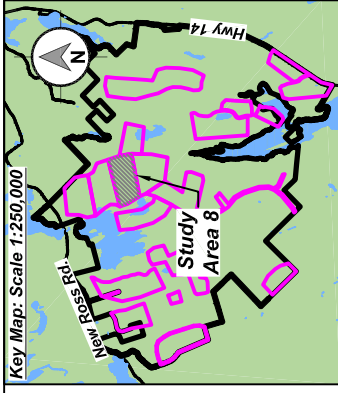
	Study Area
	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Welland Boundary (Field Observed)
	Welland Boundary (Approximate)

**Assessment Results -
Study Area 7**



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:5000	DRAWING #:	
DRAWN BY:	H. Serhan	2G	
CHECKED BY:	A. Walter		





Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

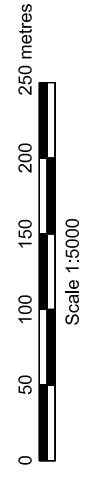
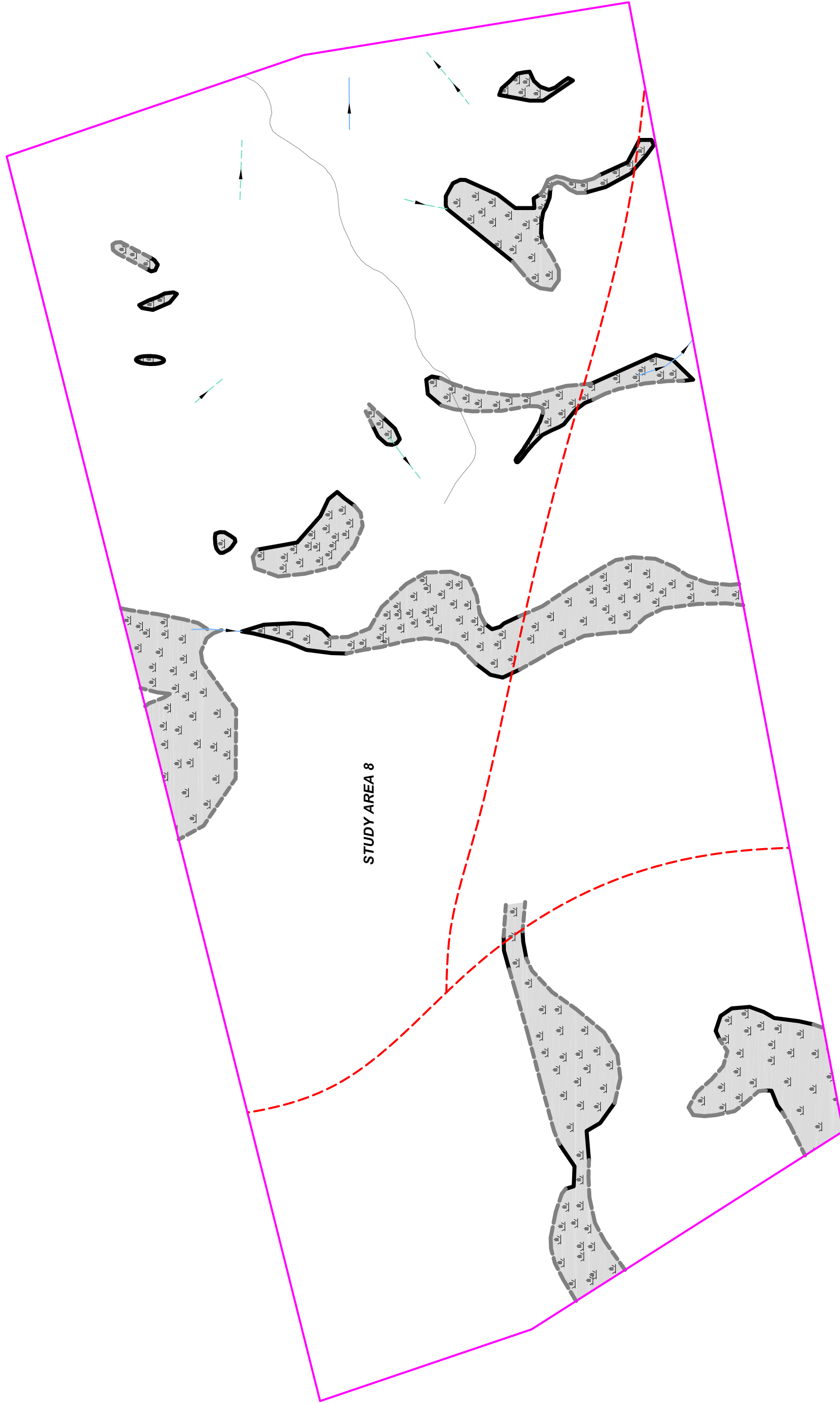
Legend:

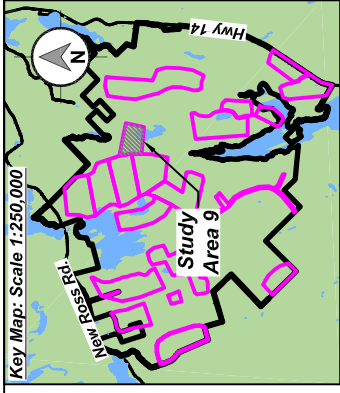
	Study Area
	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Welland Boundary (Field Observed)
	Welland Boundary (Approximate)

Assessment Results - Study Area 8



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:5000	DRAWING #:	
DRAWN BY:	H. Serhan	2H	
CHECKED BY:	A. Walter		





Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

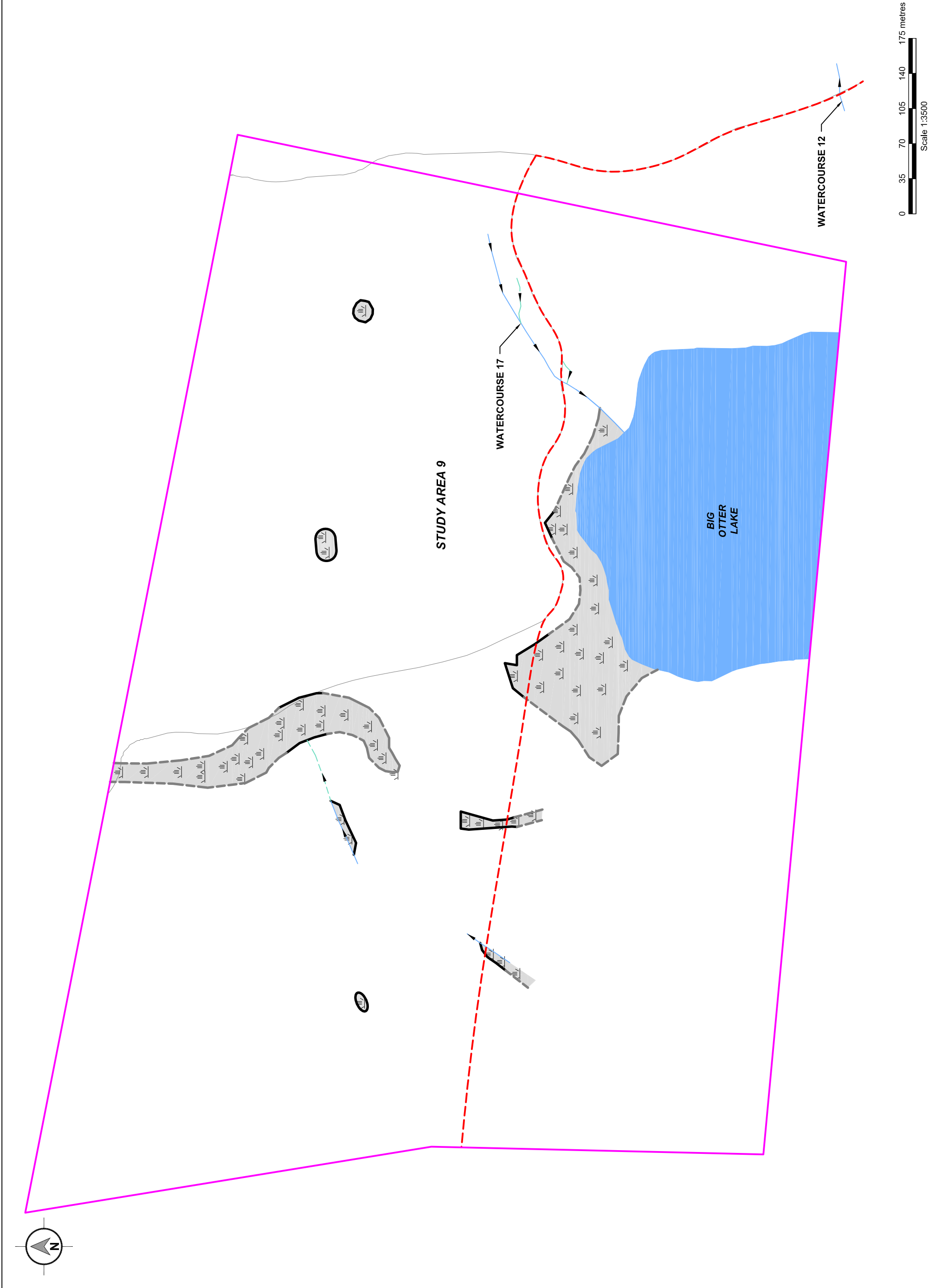
Legend:

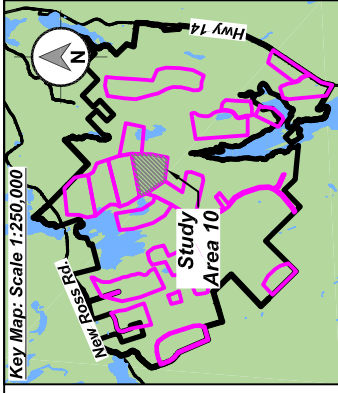
Study Area	.....
Proposed Road	.....
Existing Paved Road	.....
Existing Trail / Access Road	.....
Mapped Stream	.....
Mapped Indefinite Stream	.....
Mapped Water Bodies	.....
Field Identified Watercourse	.....
Field Identified Drainage	.....
Weiland Boundary (Field Observed)	.....
Weiland Boundary (Approximate)	.....

Assessment Results - Study Area 9



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:3500	DRAWING #:	
DRAWN BY:	H. Serhan	21	
CHECKED BY:	A. Walter		





Notes:

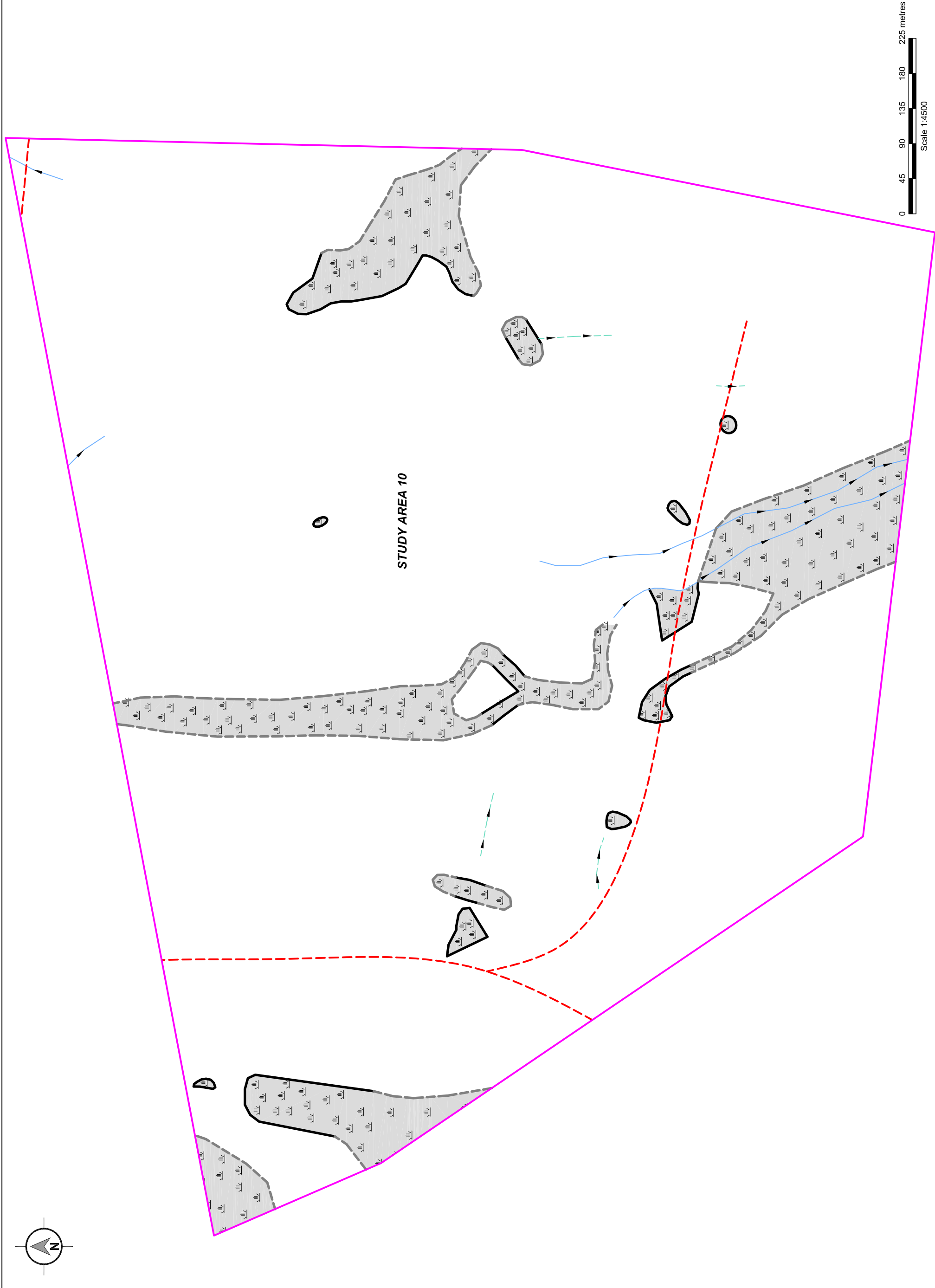
1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

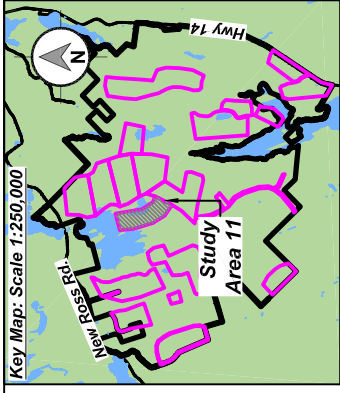
Legend:

	Study Area
	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Welland Boundary (Field Observed)
	Welland Boundary (Approximate)

Assessment Results - Study Area 10

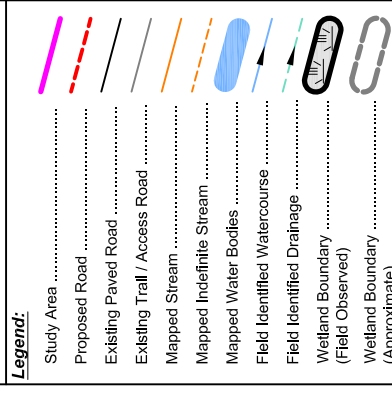
DATE: Jan. 2012		PROJECT #: 11-4140	
SCALE: 1:4500		DRAWING #: 2J	
DRAWN BY: H. Serhan		CHECKED BY: A. Walter	



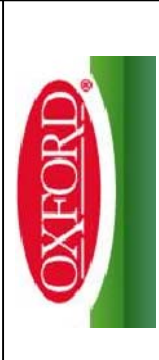


Notes:

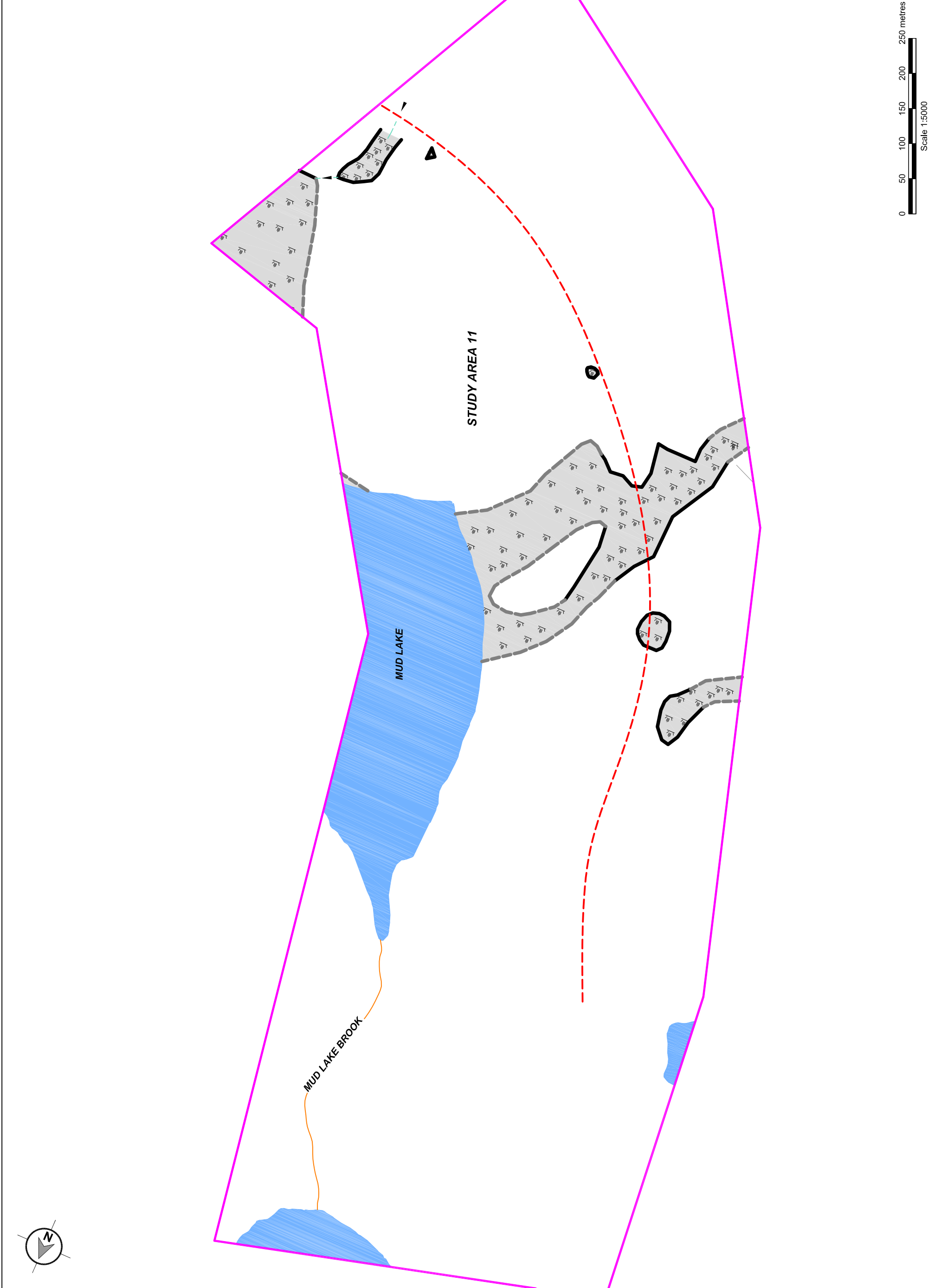
1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

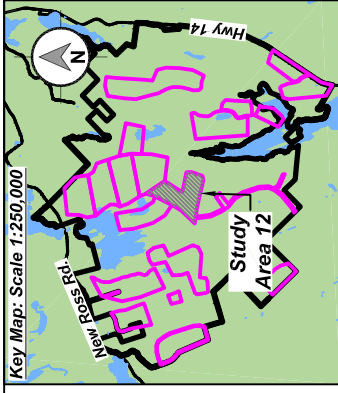


Assessment Results - Study Area 11



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:5000	DRAWING #:	
DRAWN BY:	H. Serhan	2K	
CHECKED BY:	A. Walter		





Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

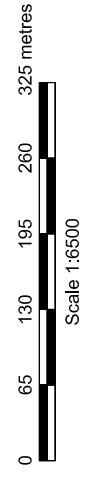
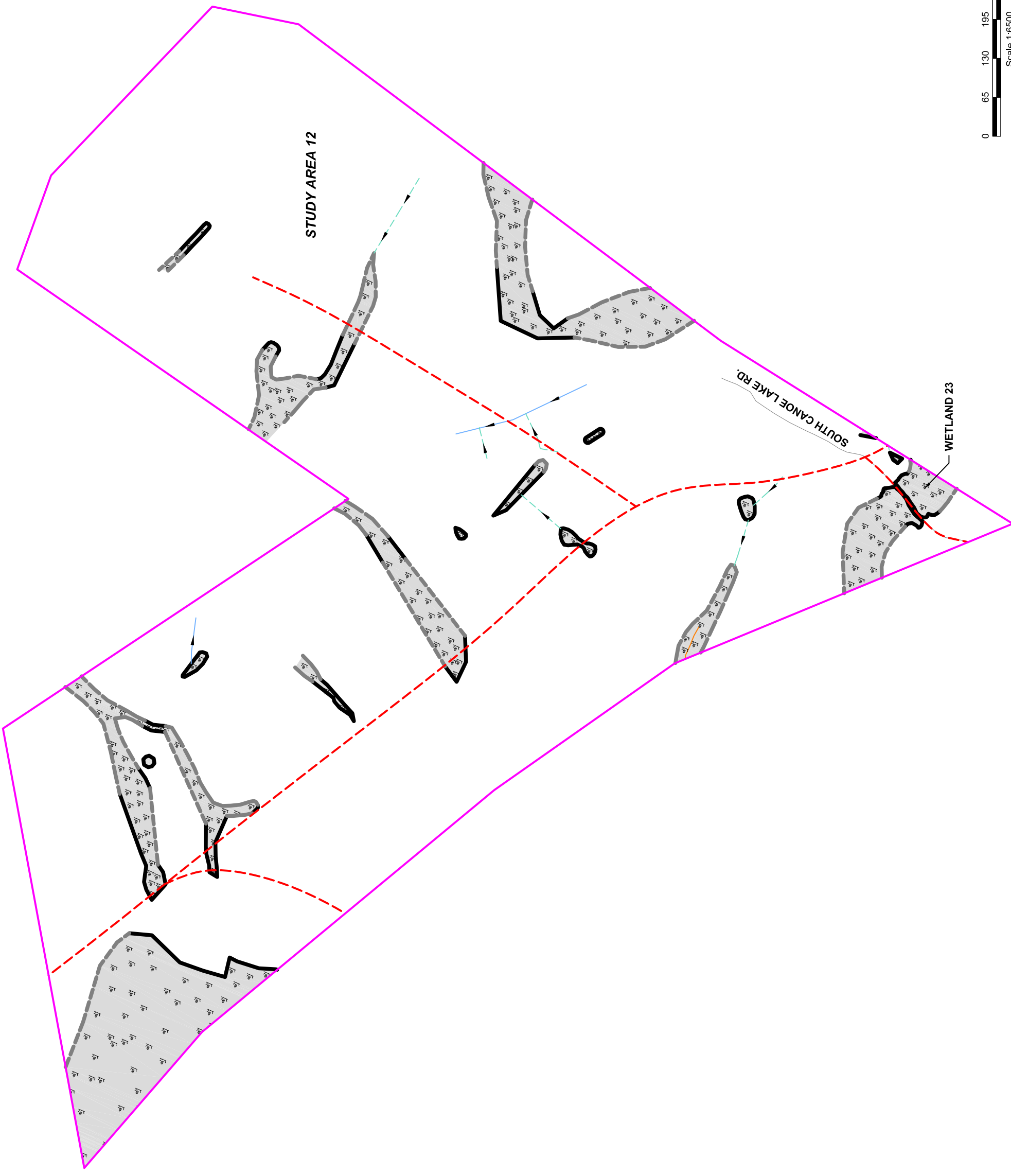
Legend:

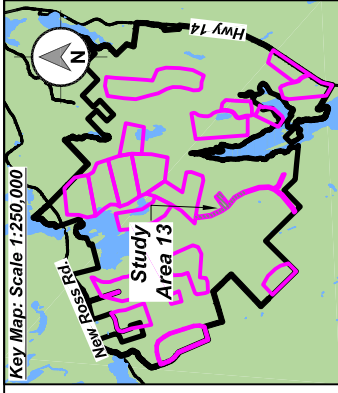
Study Area	.....
Proposed Road	.....
Existing Paved Road	.....
Existing Trail / Access Road	.....
Mapped Stream	.....
Mapped Indefinite Stream	.....
Mapped Water Bodies	.....
Field Identified Watercourse	.....
Field Identified Drainage	.....
Wetland Boundary (Field Observed)	.....
Wetland Boundary (Approximate)	.....

Assessment Results - Study Area 12



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:6500	DRAWING #:	
DRAWN BY:	H. Serhan	2L	
CHECKED BY:	A. Walter		





Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

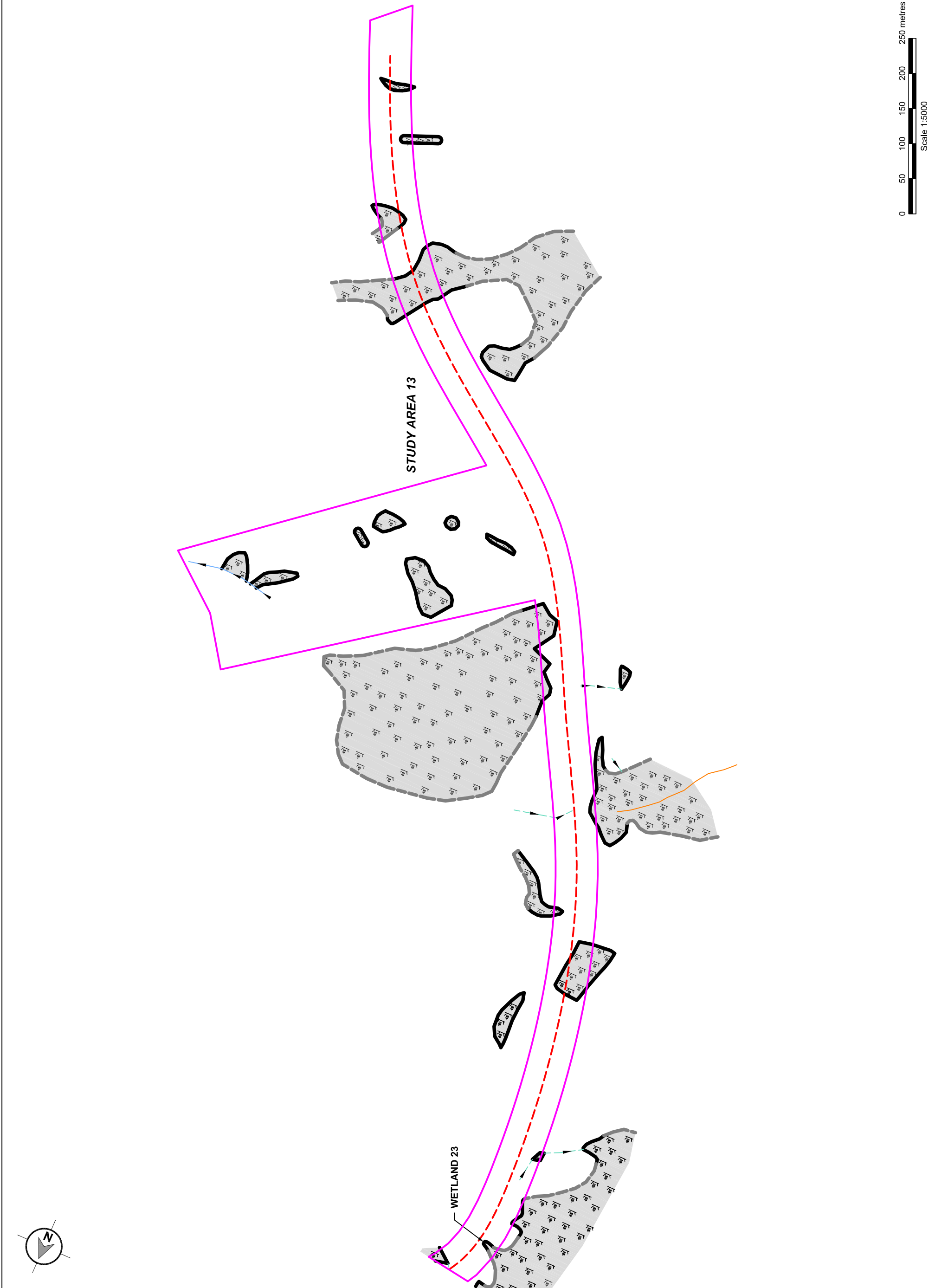
Legend:

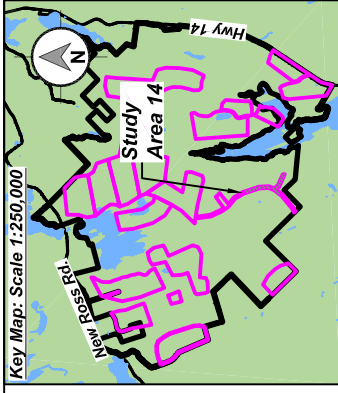
	Study Area
	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Wetland Boundary (Field Observed)
	Wetland Boundary (Approximate)

Assessment Results - Study Area 13



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:5000	DRAWING #:	
DRAWN BY:	H. Serhan	2M	
CHECKED BY:	A. Walter		





Notes:

- Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
- Projection: NAD83(CSRS), UTM Zone 20 North.

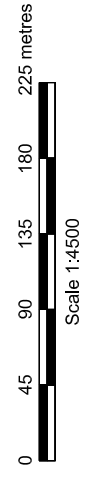
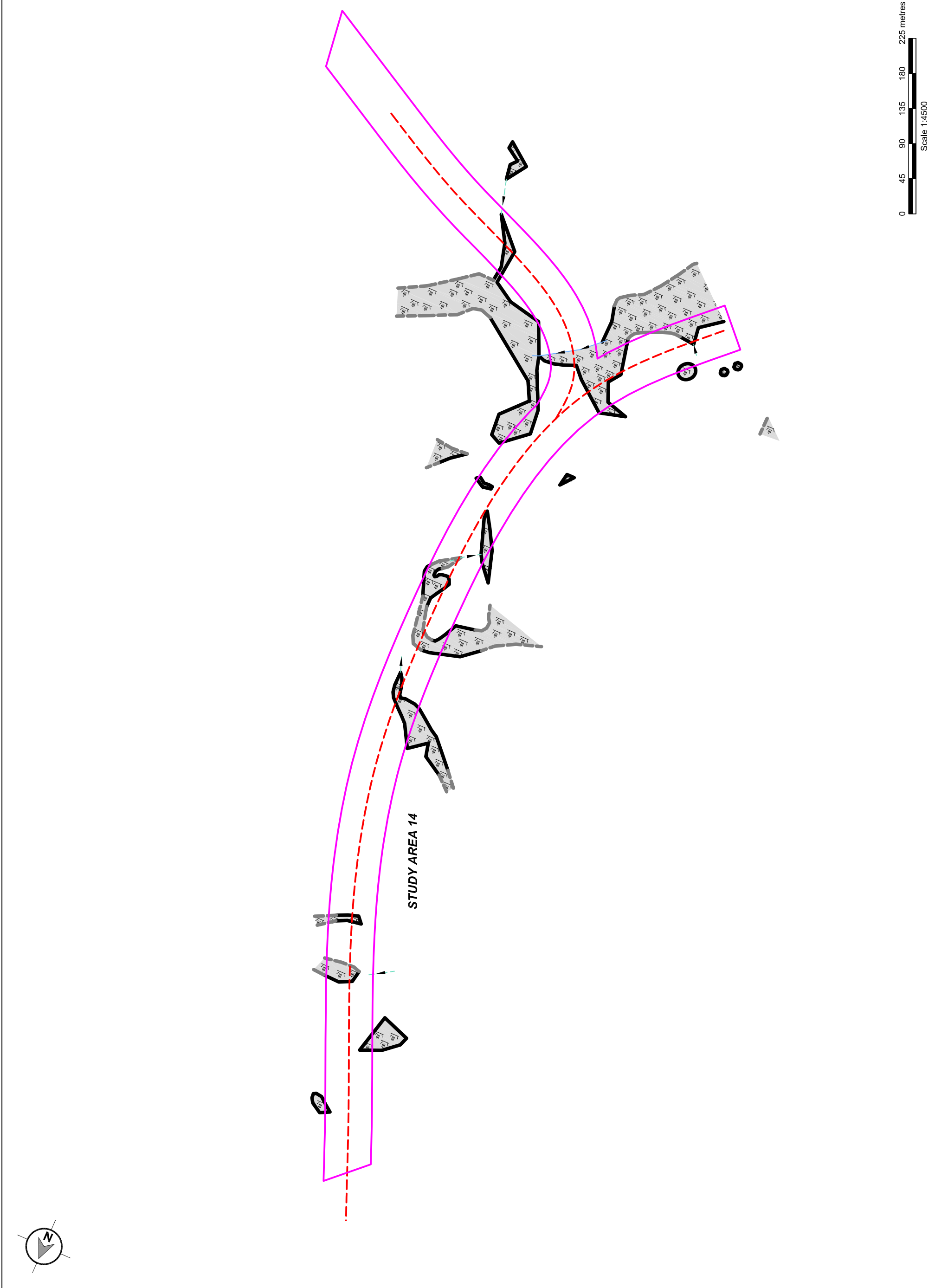
Legend:

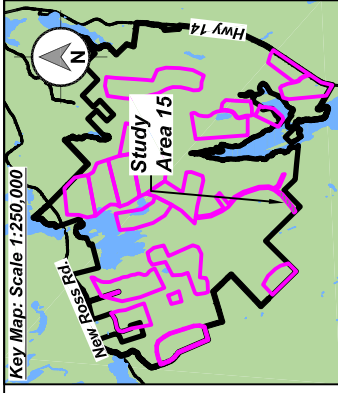
	Study Area
	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Welland Boundary (Field Observed)
	Welland Boundary (Approximate)

Assessment Results - Study Area 14



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:4500	DRAWING #:	
DRAWN BY:	H. Serhan	DRAWING #:	2N
CHECKED BY:	A. Walter		





Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

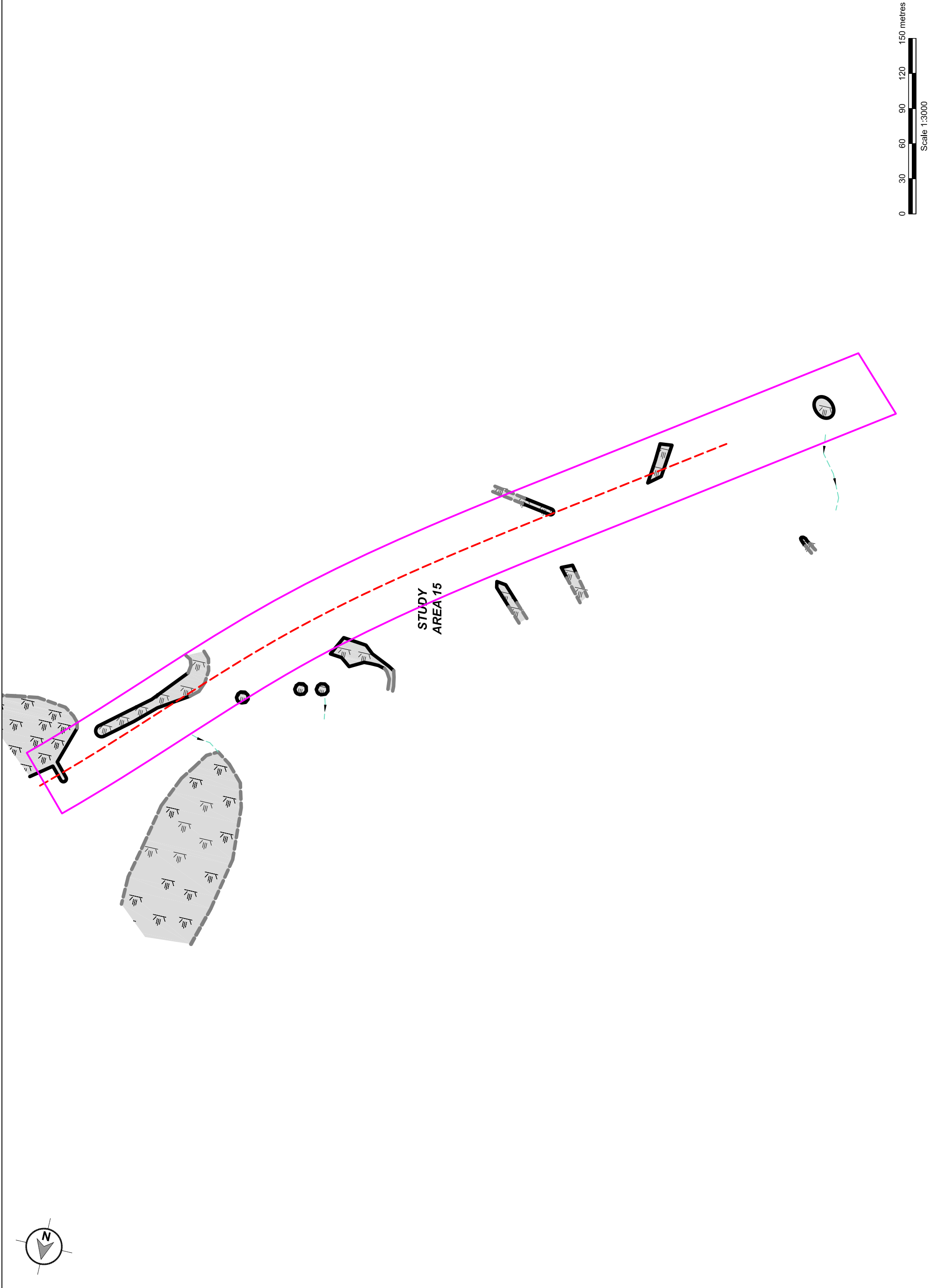
Legend:

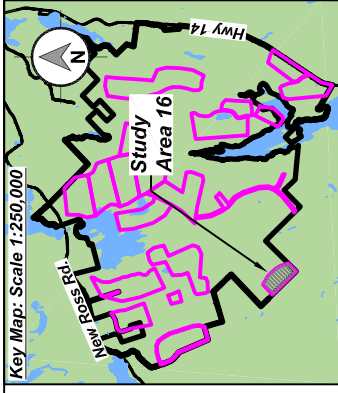
	Study Area
	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Field Identified Drainage
	Weiland Boundary (Field Observed)
	Weiland Boundary (Approximate)

Assessment Results - Study Area 15



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:3000	DRAWING #:	
DRAWN BY:	H. Serhan	20	
CHECKED BY:	A. Walter		





Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

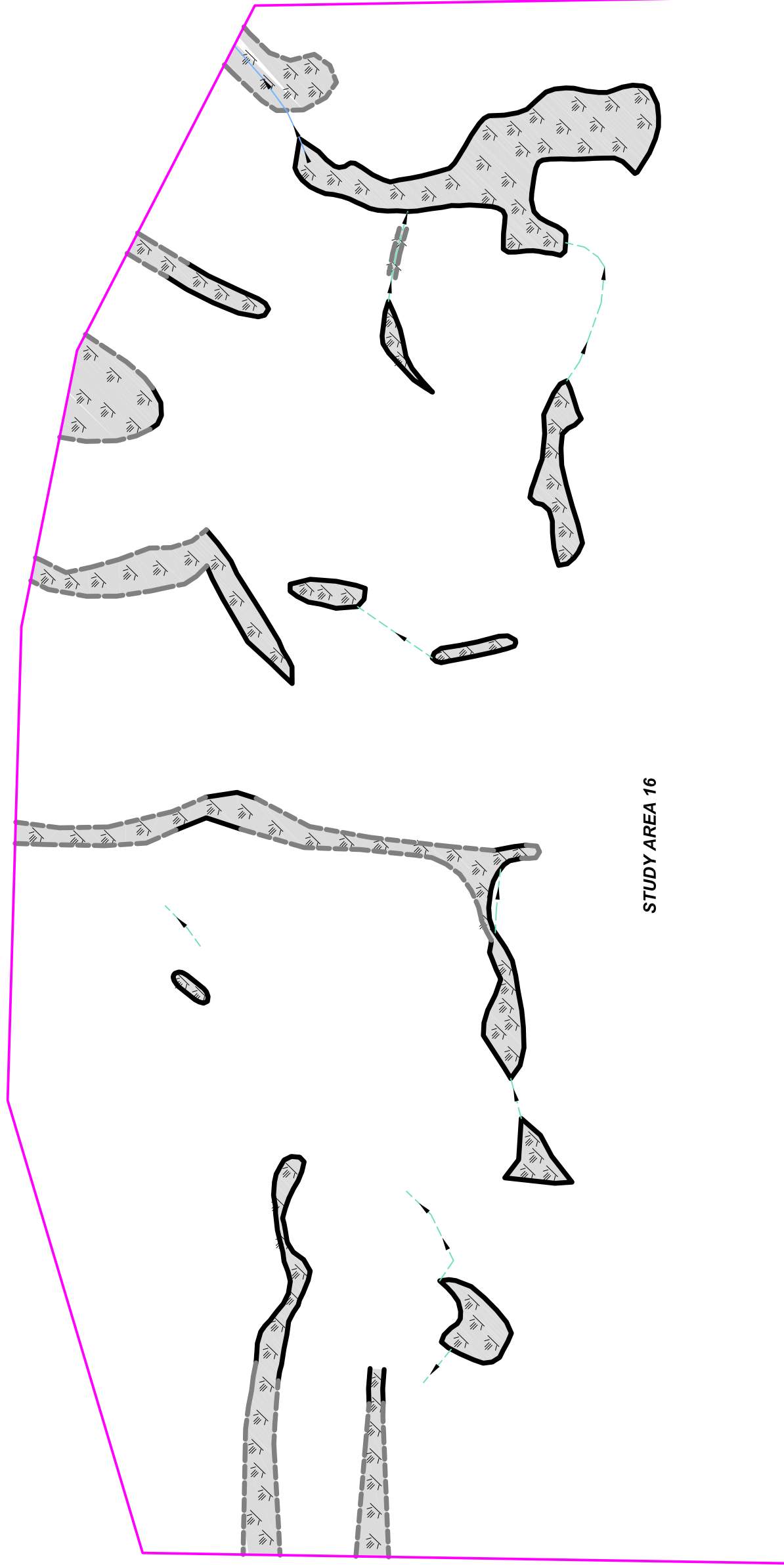
Legend:

	Study Area
	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Welland Boundary (Field Observed)
	Welland Boundary (Approximate)

**Assessment Results -
Study Area 16**



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:3500	DRAWING #:	
DRAWN BY:	H. Serhan	2P	
CHECKED BY:	A. Walter		



STUDY AREA 16

