

GNWT INF, Mackenzie Valley Highway

Administration

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Proponent

Proponent:	Department of Infrastructure Govt. of Northwest Territories Box 1320 Yellowknife, NT, X1A 2L9	Contact:	Joe Acorn Tel: (867) 767-9082 Fax: (867) 874-2272 Joe_Acorn@gov.nt.ca
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Archaeological Site Data

Archaeological site data is provided by the Prince of Wales Northern Heritage Centre and maps are not to be made available to the general public unless the scale is 1:2,000,000 or smaller, and the positional accuracy has been randomized to protect the location of the sites.

Project Description

The Government of Northwest Territories (GNWT) Department of Infrastructure (INF) requires the upgrading of portion of the Mackenzie Valley Winter Road (MVWR) to an all-weather road, extending the Mackenzie Valley Highway (MVH) approximately 297 km from Prohibition Creek in the north to Mount Gaudet in the south (the Project). The Project will also include the identification and use of new and existing quarries. The study area assessed for this Archaeological Overview Assessment (AOA) includes the current winter road alignment, the 1974 Public Works Canada alignment, and the proposed alignments within the 2011 Project Description Report for Construction of the Mackenzie Valley Highway Tulita District, Sahtu Settlement Area (EBA 2011) and the 2012 Project Description Report for the Mackenzie Valley Highway Extension Pehdzeh Ki Ndeh – Dehcho Region (GNWT DOT 2012), with a 500 m buffer on either side of each alignment. This AOA study area will provide a large enough Project footprint to allow for flexibility in the final MVH alignment.

Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).

Study Approach and Report Organization

The results of the AOA of the Project are described below. The Project footprint is presented in Figures 1 to 29, on orthographic background (1:812,000 and 1:50,000) and a combination of LiDAR and ArcticDEM background (1:50,000). Areas of high archaeological potential are noted on each figure. Some target areas appear to be within waterbodies; however, this is the result of incorrect water polygons in the LiDAR/ArcticDEM imagery and the target area location is based on orthographic imagery. All fieldwork will be conducted on land. The banks and terraces of the Deh Cho/Mackenzie and other river target areas include a buffer of 100 m from the shoreline or terrace edge, while target areas on lakes, creeks, and tributaries are buffered by 75 m from the shoreline or terrace edge. Areas not highlighted as being of high potential have been evaluated as having low archaeological potential. There are several areas where the MGP or MVFLP studies identified area moderate potential. Currently, many of the moderate areas do not have recommendations for further assessment.

Sources utilized in assessing archaeological potential include:

- the territorial archaeological site data, provided under licence from the Prince of Wales Northern Heritage Centre (PWNHC) on November 12, 2019
- the Sahtu Land Use Plan (SLUP) (Sahtu Land Use Planning Board 2013)
- the Draft Dehcho Land Use Plan (DLUP) (Dehcho Land Use Planning Committee (DLUPC) 2006): this document is a draft that is useful for understanding current and historic land use; however, it is currently non-binding in regard to regulatory process
- the Sahtu Heritage Places and Sites report (Sahtu Heritage Places and Sites Joint Working Group 2000)
- observations and results of the Archaeological Impact Assessments (AIA) for:
 - the Mackenzie Highway System, permit 1973-334 (Millar et al. 1985) (no survey polygons are available for this AIA)
 - the Mackenzie Valley Winter Road (MVWR) Upgrade Programme, permit 1999-892 (Ronaghan 2000) (no survey polygons are available for this AIA)
 - the Mackenzie Gas Project (MGP), permits 2002-916, 2003-933, 2004-956 and 2006-978 (Clarke et al. 2003; Clarke et al. 2004; Clarke and Webster 2005; Webster et al. 2007)
 - the Mackenzie Valley Fibre Link Project (MVFLP), permits 2014-017 and 2015-002 (Leyden 2016)
 - and the Granular Supply Source Areas along the Mackenzie (No.1), Liard (No.7) and Proposed Mackenzie Valley Highway, permit 2016-004 (Heffner 2018)
- the 2004 Mackenzie Valley Air Photo collection provided by the PWNHC
- surficial geology information from the Geological Survey of Canada (Hanley et al. 1973; Rutter and Boydell 1980; Rutter et al. 1980)
- Northwest Territories ecosystem classifications (Ecosystem Classification Group 2009)
- Fur Trade Posts of the Northwest Territories, 1870-1970 (Usher 1971)
- Bing™ imagery
- LiDAR imagery provided by the GNWT
- and ArcticDEM imagery

The entirety of the Project footprint was assessed for this AOA and the majority was considered to be of low archaeological potential as LiDAR, ArcticDEM, satellite imagery, and aerial photographs reveal flat and featureless landscape within heavily treed terrain. Therefore, this AOA focuses on 33 target areas within the Project footprint as having high archaeological potential; these areas include various creeks and rivers, lakes, drainages, and raised landforms. These areas were selected due to the possibility of being past and present transportation corridors, as well as being visible landmarks and/or having desirable resources such as fish, game, plant, or lithic materials. These target areas include a selection of lakes that have tributaries connecting them to other lakes, creeks, or rivers in the area (i.e., transportation corridors). Isolated lakes that appear marshy and low-lying and lack tributaries that could connect people to them from the wider landscape are considered to have low archaeological potential and were not targeted. Similarly, low-lying or undefined tributaries were not targeted unless they led to an area, either within or outside of the Project footprint, that would contain desirable resources, such as lakes or elevated landforms. The target areas represent approximately 14.5 per cent of the total AOA Project footprint. In some instances, no further work is recommended for areas assessed under previous AIAs; this is because the original assessment is considered adequate, both in the assessment of the archaeological potential of the area and the quantity of shovel tests. In instances where it is deemed that the previous

assessment may have been inadequate due to developments in field methods, it is recommended that the target area overlap previously surveyed areas.

Results

Target Area 1 (Figures 1, 2, and 16)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96E/01	UTM:	9W 626465 7228525
Area (ha):	116.1	Elevation (masl):	130
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 26 km southeast of the community of Norman Wells, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area ends on the west bank of Prohibition Creek, with the Deh Cho/Mackenzie River approximately 1.5 km to the south at its nearest point. Multiple small tributaries flow south from the Norman Range, coming together at the base of the range to create Prohibition Creek, which flows south into the Deh Cho/Mackenzie River. Numerous small lakes are present to the west of Prohibition Creek, outside of the Project footprint.
Terrain:	The MVWR is within the Project area. Many additional smaller road disturbances are also present in the vicinity of the creek within the Project footprint. Aerial photographs as well as satellite and LiDAR imagery suggest that high, dry and broad terraces may be present on the banks of the creek. Based on surficial geology mapping, it appears that the target area lies atop glacial deposits of till veneer and till blanket, as well as colluvial and sheetwash deposits along the edges of Prohibition Creek.
Previously Recorded Archaeological Sites:	Site LgRs-2, a contemporary tripod related to the Canadian National (CN) communications line, is located within 1 km of the target area, on a low-lying bank of Prohibition Creek characterized by black spruce and muskeg.

Results

Archaeological Potential Rating:	<p>The areas of highest archaeological potential lie on the terraces above Prohibition Creek since the creek may have been used as a transportation corridor in the past.</p> <p>Portions of the target area were previously surveyed for the MVFLP (permits 2014-017 and 2015-002) and for granular supply sources (permit 2016-004), as well as for the MVWR upgrade programme (permit 1999-892) in respect to the bridge emplacement (no survey area shapefiles exist for this permit). Areas of moderate archaeological potential were noted in all three reports in the form of raised landforms and terraces. These terraces, described as flat and well-defined, are ideal spots to camp and therefore have the highest archaeological site potential.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the creek, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any potentially land-altering Project activities. These areas are the unassessed portions of the terraces of Prohibition Creek.</p> <p>No further archaeological work is recommended for areas previously assessed under permits 2014-017, 2015-002, and 2016-047 or in areas of low archaeological potential, including previously disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Target Area 2 (Figures 1, 2, and 16)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96E/01	UTM:	9W 634985 7222043
Area (ha):	197.2	Elevation (masl):	110
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 37 km southeast of the community of Norman Wells, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), slope, aspect, and proximity to previously recorded archaeological sites.
Hydrology:	The target area is located on the banks of Vermillion Creek, which flows south from the Norman Mountains into the Deh Cho/Mackenzie River. The Deh Cho/Mackenzie River is approximately 3.35 km downstream of the target area in this location.
Terrain:	The MVWR is within the Project area. Multiple additional road and cutline disturbances are present in the target area at this creek. Aerial photographs as well as satellite and LiDAR/ArcticDEM imagery suggest that high, dry and broad terraces may be present on the banks of the creek. Based on surficial geology mapping, it appears that the road lies atop glacial lacustrine deposits transitioning into colluvial and sheetwash deposits as one gets closer to Vermillion Creek.
Previously Recorded Archaeological Sites:	Site LgRs-1, a precontact isolated find (a chi tho or scraper), is located within 500 m to the west of the target area, at the confluence of Nota and Vermillion creeks.

Results

Archaeological Potential Rating:	<p>Vermillion Creek is of high archaeological potential since it could have been used as a travel corridor in the past.</p> <p>Some areas of the creek were surveyed during the MVFLP (permits 2014-017 and 2015-002) and for the MVWR upgrade programme (permit 1999-892). A total of 49 shovel tests were excavated in areas assessed as having moderate potential during the MVFLP AIA and eight shovel tests were excavated under permit 1999-892, all tests were negative. Moderate potential elevated landforms on the banks of Vermillion Creek were noted during the field reconnaissance for both projects. It is these elevated landforms that have the highest archaeological potential since they may be ideal camping locations and are in close proximity to the creek.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of any undisturbed terraces of Vermillion Creek that are within the Project footprint, it is recommended that an AIA be conducted in these areas in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas that were previously assessed under permits 2014-017 and 2015-002 or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>
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Target Area 3 (Figures 1, 3, and 17)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96F/04	UTM:	10V 360022 7215831
Area (ha):	14.4	Elevation (masl):	160
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 22 km northwest of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), aspect, and proximity to previously recorded archaeological sites.
Hydrology:	The Project footprint encompasses the southwestern edge of an unnamed lake, including the lake's confluence with Jungle Ridge Creek, which connects to the Deh Cho/Mackenzie River. The Deh Cho/Mackenzie River is approximately 6 km southwest of the target area at its nearest point.
Terrain:	Aerial photographs and satellite and ArcticDEM imagery suggest that elevated and dry landforms may be present on the shore of the lake. Based on surficial geology mapping, it appears that the target area lies atop morainal plain deposits.
Previously Recorded Archaeological Sites:	Site LgRr-1, an historic campsite (Jungle Ridge Campsite), is located within the target area. The site was identified during the MGP AIA for permit 2006-978 (Webster et al. 2007) and it was recommended that the site be avoided. If the site could not be avoided, it was recommended that additional investigations to fully record site artifacts and features be conducted prior to development

Results

Archaeological Potential Rating:	<p>The areas of highest archaeological potential lie on any elevated landforms that may be present on the banks of the unnamed lake, which have the potential to be good camping spots. Jungle Ridge Creek may also have been used as a travel corridor to the lake from the Deh Cho/Mackenzie River, which would increase the likelihood of archaeological sites being present in the target area.</p> <p>A borrow source in the vicinity of the unnamed lake, including the confluence of the lake and Jungle Ridge Creek was surveyed for the MGP (permit 2006-978). A total of 388 shovel tests were excavated and one site, LgRr-1, was identified. This area was noted to have moderate archaeological potential during the MGP AIA, with elevated landforms identified in proximity to the lake.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the lake, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any potentially land-altering Project activities. These high potential areas are any unassessed dry and elevated landforms on the banks of the unnamed lake. In addition, site LgRr-1 should be revisited during the AIA in order to confirm the condition and location of the site.</p> <p>No further archaeological work is recommended for areas previously assessed under permit 2006-978, except for site LgRr-1, or in areas of low archaeological potential, including previously disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Target Area 4 (Figures 1, 3, and 17)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/13	UTM:	10W 371143 721034
Area (ha):	181.4	Elevation (masl):	265
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), Norman Range Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 11.5 km northwest of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), aspect, and proximity to previously recorded archaeological sites.
Hydrology:	Multiple small, unnamed lakes are present in the vicinity of the target area, including a portion of one large and one smaller unnamed lake that are within the target area and are located on the east side of Kwetjnj?ah/Bear Rock, a prominent landform. The Deh Cho/Mackenzie River is approximately 7 km to the south-southwest of the target area at its nearest point.
Terrain:	The MVWR is within the target area, as well as smaller linear disturbances. Various imagery (aerial photographs, satellite and LiDAR/ArcticDEM) suggests that the target area lies atop and on the sides of Kwetjnj?ah/Bear Rock. Based on surficial geology mapping, the target area lying on top of the eastern edge of Kwetjnj?ah/Bear Rock is within morainal veneer, while the remainder of the target area lies atop bedrock with some areas of colluvial veneer deposits.
Previously Recorded Archaeological Sites:	Two sites, site LfRf-6, a precontact lithic scatter, and LfRr-7, a precontact isolated find, are within the target area on top of Kwetjnj?ah/Bear Rock. Four additional sites, LfRr-1, LfRr-2, LfRq-13, and LfRr-5, are located within 2 to 5 km of the target area and are located on the east side of Kwetjnj?ah /Bear Rock.

Results

Archaeological Potential Rating:	<p>The target area lies atop Kwetjnj?ah/Bear Rock, an important physical and cultural landmark, which suggests that it has high archaeological potential. Aside from this, it may be source of good game and lithic resources, amongst others. The areas of highest archaeological potential lie on any dry and elevated landforms along the banks of the unnamed lakes within the target area, as well as areas of exposed lithic material that would make good quarry sources. High, flat, broad ridges and hilltops that offer easily traversed terrain and good viewsheds are also of high archaeological potential.</p> <p>Portions of the target area have been previously assessed for the MGP (permits 2003-933 and 2004-956), the MVFLP (permits 2014-017 and 2015-002), and for granular supply sources (permit 2016-004). The area was determined to have moderate to high archaeological potential during the ground reconnaissance for these AIAs due to being situated on Kwetjnj?ah /Bear Rock, as well as the presence of high, broad landforms, travel corridors, and traversable terrain.</p>
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Recommendations

The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River) in this target area. SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. The target area also lies within Conservation Zone (CZ) 32: Petı́nı́ah (Bear Rock). CZ 32 was established to protect one of the most sacred sites for the Dene, as well as cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ and CZ have potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any land-altering Project activities. These high potential areas are any high, flat, broad ridges or dry, elevated landforms. It is also recommended that sites LfRr-6 and LfRr-7 be revisited.

No further archaeological work is recommended for the areas assessed for permits 2014-017, 2015-002, and 2016-004 or in areas of low archaeological potential, including disturbed lands.

The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Area 5 (Figures 1, 4, and 18)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/13	UTM:	10W 373543 7207891
Area (ha):	34.9	Elevation (masl):	235
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), Norman Range Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 8.2 km northwest of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), aspect, and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses a lake, colloquially known as Trout Lake in the local area (Clarke et al. 2003), which lies on the east aspect of Kwetı́nı́ah /Bear Rock. The Deh Cho/Mackenzie River is approximately 6 km to the south-southwest at its nearest point. MacKay Creek connects Trout Lake to the Deh Cho/Mackenzie River, although it appears to

	currently be ephemeral in nature based on LiDAR and satellite imagery. A number of additional, smaller unnamed lakes are present in the vicinity of the target area.
Terrain:	The MVWR is on the eastern edge of the target area. Aerial photographs and satellite and LiDAR imagery suggest that elevated and dry landforms may be present on the shore of the lake. The target area lies within complicated surficial geology, with the northeastern portion atop bedrock with morainal veneer, while the southwestern portion also lies atop of bedrock as well as colluvial veneer. The eastern bank of the lake lies within alluvial fan and colluvial complex deposits and the western bank lies atop colluvial complex with some bedrock outcrops.
Previously Recorded Archaeological Sites:	Three sites are within the target area: site LfRr-1, an Indigenous historic campsite, near the east bank of Trout Lake; and sites LfRr2, a campsite of undetermined age, and LfRr-5, an Indigenous historic trail, on the north bank of Trout Lake. Site LfRr-2 is located on a low terrace. Site LfRq-13, a contemporary campsite, is also located to the east of the target area, within 2 km.

Results

Archaeological Potential Rating:	<p>The areas of highest archaeological potential lie on any elevated and dry landforms on the shore of Trout Lake that would have made ideal camping spots. MacKay Creek may have served as a transportation corridor from the Deh Cho/Mackenzie River to the lake, making it more likely that this area was utilized in the past. As the name of the lake suggests, fish may be present in this target area, as well as game animals and plant resources. The presence of historic period sites within the target area confirm the high potential of the lake.</p> <p>Portions of the target area were previously surveyed for the MGP (permit 2002-916), with five negative shovel tests excavated.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the lake, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any potentially land-altering Project activities. These areas are the undisturbed portions of any elevated and dry landforms on the banks of Trout Lake that would have made good camping locations, as well as where MacKay Creek meets the lake. It is also recommended that sites LfRr-1, LfRr-2, and LfRr-5 be revisited.</p> <p>No further archaeological work is recommended for areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>
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Target Area 6 (Figures 1, 4, and 18)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/13	UTM:	10W 376588 7201239
Area (ha):	141.4	Elevation (masl):	95
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 1.2 km northwest of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), aspect, and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses the confluence of the Deh Cho/Mackenzie River and Sahtu Deh/Great Bear River.
Terrain:	The MVWR is within the target area, as well as multiple smaller disturbances. Aerial photographs, as well as satellite and LiDAR/ArcticDEM imagery suggest that elevated and dry landforms may be present along the banks of the Deh Cho/Mackenzie River and the Sahtu Deh/Great Bear River. The target area lies within various surficial geology deposits, with the bank of the Deh Cho/Mackenzie River being alluvial till deposits to the west and morainal plain deposits as one nears the confluence with Sahtu Deh/Great Bear River. The west bank of Sahtu Deh/Great Bear River is bedrock with alluvial till present, while the east bank also has bedrock and alluvial till nearest the water edge, with colluvial complex deposits as one moves further east.

Previously Recorded Archaeological Sites:	<p>Five sites are located on the west bank of Sahtu Deh/Great Bear River within the target area: precontact campsites LfRq-6, LfRq-16, LfRq-17, and LfRq-18, as well as site LfRq-19, a precontact isolated find.</p> <p>Three sites are within the target area located on the east bank of the Sahtu Deh/Great Bear River: sites LfRq-10, an Indigenous historic trail; LfRq-12, a contemporary campsite; and LfRq-24, an historic barge landing.</p> <p>In addition to the sites within the target area, four sites are within 1 km of the target area: sites LfRq-9, a precontact lithic scatter, and LfRq-11 and LfRq-15, both contemporary campsites, are located on the east bank of the Sahtu Deh/Great Bear River; site LfRq-23, an historic camp/barge landing is on the west bank at the confluence of the Sahtu Deh/Great Bear River and the Deh Cho/Mackenzie River.</p> <p>Sites LfRq-1, LfRq-3, LfRq-4, LfRq-7, LfRq-8, and LfRq-14, are within 2 to 5 km of Target Area 6, or, are located in or within 1 km of Target Area 7 (see below).</p> <p>Site LfRq-20, an Indigenous historic trail, is within 4 km of the target area, to the east of the Sahtu Deh/Great Bear River.</p>
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Results

Archaeological Potential Rating:	<p>The numerous sites that are within, or less than 5 km from, the target area indicate that this area is of high archaeological potential. The areas of highest archaeological potential lie on any elevated and dry terraces on the banks of the Deh Cho/Mackenzie River and the Sahtu Deh/Great Bear River that would have made good camping locations. Fort Norman, now Tulita, is also near the target area (Usher 1971). The fort was established in 1851 and would have made this area a hub for activity in historic times. Forts were also often strategically placed in areas that were already common meeting points/landmarks, further suggesting that precontact archaeology sites will be present in the target area.</p> <p>Portions of the target area were previously surveyed for the MGP (permits 2002-916 and 2003-933), with 19 negative shovel tests excavated on the banks of the Sahtu Deh/Great Bear River during the 2002 survey. A portion of the target area was also assessed by the MVFLP (permits 2014-017 and 2015-002); no shovel tests were excavated. In addition, some areas north of the target area, within the project footprint, were assessed for the MGP (permits 2003-933, 2004-956, and 2006-978) and a quarry source near the east bank of Sahtu Deh/Great Bear River, outside of the Project footprint, was assessed under permit 2016-004. The areas assessed along the Deh Cho/Mackenzie River for the MGP were assessed as having low archaeological potential, however, the MGP footprint was more limited and higher potential areas may be present within the current MVH target area. Moderate to high archaeological potential was noted during previous AIAs along the Sahtu Deh/Great Bear River due to the presence of terraces and the proximity to the townsite and confluence of the Sahtu Deh/Great Bear and Deh Cho/Mackenzie rivers.</p>
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Recommendations

The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 33: Sahtu Deh (Great Bear River) and SMZ 63: The Deh Cho (Mackenzie River). SMZs 33 and 63 were established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. SMZ 33 is also noted as being an important travel corridor between the Mackenzie River and Great Bear Lake. These SMZs have the potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any potentially land-altering Project activities. These areas are the undisturbed portions of any elevated and dry landforms on the banks of the Deh Cho/Mackenzie and Sahtu Deh/Great Bear rivers that would have made good camping locations. It is also recommended that the sites within the Project footprint are revisited.

No further archaeological work is recommended for the areas assessed under permits 2014-017 and 2015-002 or in areas of low archaeological potential, including disturbed lands.

The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Area 7 (Figures 1, 4, and 18)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/13	UTM:	10W 379018 7199624
Area (ha):	264.4	Elevation (masl):	65
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located within the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), aspect, and proximity to previously recorded archaeological sites.
Hydrology:	The target area is on the north bank of the Deh Cho/Mackenzie River, near the confluence with Sahtu Deh/Great Bear River.

Terrain:	The MVWR is within the Project area. A portion of the community of Tulita is within the target area, with many disturbances present. Based on surficial geology mapping, the target area lies atop alluvial terrace deposits in the southern half and lacustrine plain with organic deposits in the northern half. A small area of colluvial complex deposits are present near the Sahtu Deh/Great Bear River.
Previously Recorded Archaeological Sites:	<p>Six sites are located within the target area: sites LfRq-1, a precontact lithic scatter, LfRq-3, a campsite of undetermined age, LfRq-4, a precontact artifact and lithic scatter; LfRq-7, a precontact wood scatter; LfRq-8, a precontact hearth and historic trading post; and LfRq-14, a contemporary campsite.</p> <p>One site, LfRq-23, an historic camp/barge landing, is located to the west, within 1 km of the target area.</p> <p>Sites LfRq-6, LfRq-9, LfRq-10, LfRq-11, LfRq-12, LfRq-15, LfRq-16, LfRq-17, LfRq-18, LfRq-19, and LfRq-24 are located within 2 to 5 km of the target area, in or within 1 km of Target Area 6 (see above).</p> <p>Site LfRq-20 is within 3 km of the target area, to the north.</p>

Results

Archaeological Potential Rating:	<p>The numerous sites that are within, or less than 3 km from, the target area indicate that this area is of high archaeological potential. The areas of highest archaeological potential lie on any elevated and dry terraces on the banks of the Deh Cho/Mackenzie River that would have made good camping locations. Fort Norman, now Tulita, is within the target area, indicating the historic use of the area and further indicating that the target area has high archaeological potential. However, the townsite is not considered to be an archaeological site as it has not been abandoned for 50 years. For this reason, the entire townsite is not included within the target area.</p> <p>The target area also includes some areas of disturbed/low archaeological potential in order to incorporate sites LfRq-1 and LfRq-3 within the target area. Therefore, this target area will be further refined during the AIA ground reconnaissance.</p> <p>A portion of the target area was previously surveyed for the MGP (permit 2003-933), with two negative shovel tests excavated in the surveyed area. A portion of the target area was also assessed by the MVFLP (permits 2014-017 and 2015-002); no shovel tests were excavated. During the MVFLP AIA, the target area was noted to have moderate to high archaeological potential due to the presence of structural remains and the proximity to the townsite.</p>
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Recommendations

The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any potentially land-altering Project activities. These areas are the undisturbed portions of any elevated and dry landforms on the banks of the Deh Cho/Mackenzie River that would have made good camping locations. It is also recommended that the sites within the target area are revisited.

No further archaeological work is recommended for the areas assessed under permits 2014-017 and 2015-002 or in areas of low archaeological potential, including disturbed lands.

The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Area 8 (Figures 1, 5, and 19)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/14	UTM:	10W 389940 7199880
Area (ha):	164.4	Elevation (masl):	95
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 10.3 km east of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), aspect, and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses a chain of unnamed lakes and the banks of an unnamed tributary. The Deh Cho/Mackenzie River is approximately 1 km south of the target area at its nearest point and numerous small lakes are present in the vicinity of the target area.

Terrain:	The MVWR is located just south of the unnamed lakes and crosses the target area at the unnamed tributary. A small, linear disturbance is present along the western edge of the chain of unnamed lakes. Aerial photographs and satellite and LiDAR/ArcticDEM imagery suggest that elevated and dry landforms may be present on the shores of the lakes and along the tributary. Based on surficial geology mapping, the target area lies primarily on lacustrine plain with organic deposits, with a portion of the western edge of the target area the edges of the tributary lacking the organic deposits. The majority of the tributary itself falls within colluvial complex deposits.
Previously Recorded Archaeological Sites:	<p>One site, LfRp-7, an Indigenous historic campsite and trail, is located within the target area, at the east end of the most westerly lake.</p> <p>An additional five sites are located within 2 km of the target area, on the opposite bank of the Deh Cho/Mackenzie River: site LfRp-1, a precontact and/or contemporary burial; sites LfRp-3, LfRp-4, and LfRp-6, all contemporary campsites, and LfRp-5, an historic cut wood feature. However, the location of all five sites is only an approximation and the exact locations are unknown.</p>

Results

Archaeological Potential Rating:	<p>The presence of an historic campsite, identified under permit 2002-916, believed to be a 1950s-era camp, as well as a trail leading from the camp to the neighbouring lake that was noted when the campsite was recorded, suggests that these unnamed lakes are of high archaeological potential. It was also noted by one of the community assistants on the 2002 MGP survey that an earlier location of the camp had been established on the north side of the creek that extends east to the neighbouring lake (Clarke et al. 2003). It is unclear if there was an attempt to identify this previous camp location during the MGP 2002 AIA. The presence of a tributary that provides a possible transportation corridor between the Deh Cho/Mackenzie River to the lakes increases their archaeological potential, as well as that of the tributary itself. The areas of highest archaeological potential lie on any elevated and dry terraces on the banks of the lakes or tributary that would have made good camping locations.</p> <p>A portion of the target area was previously surveyed for the MGP (permit 2002-916), with 14 shovel tests excavated in the surveyed area. A portion of the unnamed tributary was assessed by the MVFLP (permits 2014-017 and 2015-002), with 8 negative shovel tests excavated on the west side of the tributary and 15 on the east side. The MGP (permit 2006-978) also surveyed an area near the tributary, with 90 negative shovel tests excavated. A photograph of site LfRp-7 in the final report for permit 2002-916 reveals dry, flat, raised banks above the unnamed lake in that location, suggesting the area has high archaeological potential. The MVFLP and MGP AIAs note low to moderate archaeological potential along the unnamed tributary due to the terrain elevation (Leyden 2006). However, the areas assessed for these projects are away from the lakes and higher potential areas may be closer to the lake shores, in the vicinity of site LfRp-7.</p>
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Recommendations

The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any potentially land-altering Project activities. These areas are the undisturbed portions of any elevated and dry landforms on the banks of the unnamed lakes and tributary that would have made good camping locations. It is also recommended that site LfRp-7 be revisited.

No further archaeological work is recommended for areas of low archaeological potential, including disturbed lands.

The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Area 9 (Figures 1, 5, and 19)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/14	UTM:	10W 398239 7198559
Area (ha):	92.8	Elevation (masl):	110
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 19 km east of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses the south bank of a large, unnamed lake and the edges of a low-lying tributary that connects the lake to the Deh Cho/Mackenzie River. The Deh Cho/Mackenzie River is approximately 900 m south of the target area, and numerous small lakes are present in the vicinity of the target area.
Terrain:	The MVWR is within the Project area. Various imagery (aerial photographs, satellite, and LiDAR/ArcticDEM) suggest that elevated and dry landforms may be present on the shore of the lake and possibly along the tributary. Based on surficial geology mapping, the target area

	lies on lacustrine plain on the eastern half of the lake edge and along the tributary, with the western half also being within lacustrine plain in addition to organic deposits.
Previously Recorded Archaeological Sites:	One site, LfRp-2, a contemporary campsite, is located to the southeast, on the banks of the Deh Cho/Mackenzie River, within 5 km of the target area.

Results

Archaeological Potential Rating:	<p>The lake itself may be a source of resources such as fish, game animals, and plants. The presence of tributaries, both inside and outside of the Project footprint, may have provided transportation corridors between the Deh Cho/Mackenzie River and the lake, although these tributaries appear to be undefined in satellite imagery, aerial photographs, and LiDAR/ArcticDEM imagery. However, they may have been more defined in the past. Any elevated and dry landforms on the bank of the lake or tributary would make ideal camping locations and are therefore considered to be of high archaeological potential.</p> <p>A portion of the target area was previously surveyed for the MGP (permits 2002-916), with no shovel testing conducted. No additional information is available for this target area.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted of any elevated and dry landforms on the shores of the unnamed lake in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>
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Target Area 10 (Figures 1, 5, and 19)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/14	UTM:	10W 400469 7196400
Area (ha):	87.3	Elevation (masl):	105
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 22.1 km east of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses the banks of Little Birch River. The Deh Cho/Mackenzie River is approximately 850 m southwest of the target area at its nearest point. Numerous small lakes are in the vicinity of the target area.
Terrain:	The MVWR passes through the target area, as well as an additional linear disturbance to the south. LiDAR/ArcticDEM imagery suggests that the creek is well incised with broad terraces along its banks. Based on surficial geology mapping, the west bank of Little Birch River sits on lacustrine plain, while the creek itself and the east bank are within colluvial complex deposits.
Previously Recorded Archaeological Sites:	Site LfRp-2, a contemporary campsite, is within 2 km of the target area to the southeast.

Results

Archaeological Potential Rating:	<p>The creek appears to have the potential for elevated and dry terraces or other landforms that would make good camping locations and therefore would have high archaeological potential. The creek also leads to an unnamed lake, which would encourage people to use the creek as a transportation corridor to reach the lake, increasing the likelihood of the archaeological sites present near the creek.</p> <p>A portion of the target area was previously surveyed for the MVFLP (permits 2014-017 and 2015-002), with nine negative shovel tests excavated on the west side of the creek and seven on the east side. The creek was noted during this AIA as having low to moderate archaeological potential due to the terrain elevation (Leyden 2006).</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any potentially land-altering Project activities. These areas are the undisturbed portions of any elevated and dry landforms on the banks of Little Birch River that would have made good camping locations.</p> <p>No further archaeological work is recommended for the areas assessed under permits 2014-017 and 2015-002 or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Target Area 11 (Figures 1, 5, and 19)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/14	UTM:	10W 403076 7193792
Area (ha):	23	Elevation (masl):	105
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 25.4 km east-southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), aspect, and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses the southwest edge of a large unnamed lake. The Deh Cho/Mackenzie River is located approximately 2.6 km to the west at its nearest point. Numerous tributaries and unnamed lakes are in the vicinity of the target area.
Terrain:	Aerial photographs and satellite and LiDAR imagery suggest that elevated and dry landforms may be present on the shores of the lake. Based on surficial geology mapping, the western half of the target area is within lacustrine plain with organic deposits, while the eastern half is also within lacustrine plain but with eolian deposits.
Previously Recorded Archaeological Sites:	Site LfRp-2, a contemporary campsite, is located to the west of target area, within 3 km, on the bank of the Deh Cho/Mackenzie River.

Results

Archaeological Potential Rating:	This lake is one of the larger lakes in this area within the Project footprint and may be a source of resources such as fish, game animals, and plants. Low-lying, ill-defined tributaries connect the lake to others in the area and they may have been used as transportation corridors between lakes. Due to these reasons, the lakeshore is considered to have high archaeological potential. The areas of highest archaeological potential lie on any elevated and dry landforms on the bank of the lake that would have made good camping locations.
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	<p>Although target area 11 appears to partially be within the lake, this is the result of incorrect water polygons in the LiDAR/ArcticDEM imagery. The target area location is based on orthographic imagery, all fieldwork will be conducted on land</p> <p>An area near the lake was previously surveyed for the MGP (permits 2002-916 and 2006-978), with 344 negative shovel tests excavated in the 2006 surveyed area. It was noted during the survey for permit 2006-978 that the area had moderate archaeological potential.</p>
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Recommendations

The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any potentially land-altering Project activities. These areas are the undisturbed portions of any elevated and dry landforms on the bank of the unnamed lake that would have made good camping locations.

No further archaeological work is recommended for areas of low archaeological potential, including disturbed lands.

The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Area 12 (Figures 1, 5, and 19)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/14	UTM:	10W 403564 7192063
Area (ha):	94.9	Elevation (masl):	105
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 26.4 km east-southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area includes the banks of an unnamed lake and a tributary that connects the unnamed lake to the Deh Cho/Mackenzie River. The Deh Cho/Mackenzie River is located

	approximately 1.9 km to the west of the target area at its nearest point. Numerous unnamed lakes and tributaries are near the target area.
Terrain:	The MVWR is within the Project area. Aerial photographs and satellite and LiDAR/ArcticDEM imagery suggest that elevated and dry landforms may be present on the shores of the lake and banks of the tributary. Based on surficial geology mapping, the lake and the eastern half of the tributary are within lacustrine plain with organic deposits, while the remainder of the tributary is within colluvial complex deposits and lacustrine plain without organic deposits.
Previously Recorded Archaeological Sites:	Site LfRp-2, a contemporary campsite, is within 4 km of the target area, to the northwest, on the bank of the Deh Cho/Mackenzie River.

Results

Archaeological Potential Rating:	<p>This lake may be a source of fish, game animals, or plant resources. The lake is attached to other lakes in the area through low-lying, undefined tributaries which could be used as transportation corridors. It is for these reasons that the area is presumed to have high archaeological potential. As with other waterbodies, the areas of highest potential are any elevated and dry landforms in proximity to the lake that would have provided good camping locations.</p> <p>The area just north of the unnamed lake was surveyed for the MVFLP (permits 2014-017 and 2015-002). No shovel testing was conducted and the area was noted as have low/moderate archaeological potential due to the terrain elevation (Leyden 2016). However, areas of high archaeological potential may be present closer to the lake.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential, which are any dry and elevated landforms, in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>
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Target Area 13 (Figures 1, 6, and 20)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/14	UTM:	10W 405004 7191483
Area (ha):	119.4	Elevation (masl):	110
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 28.1 km east-southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses numerous small lakes, including the west bank of a large, unnamed lake. The Deh Cho/Mackenzie River is located approximately 4.1 km west of the target area at its nearest point. Numerous small unnamed lakes and tributaries are present in the vicinity of the target area.
Terrain:	The MVWR passes through the target area and an additional linear disturbance is present near the west bank of the large, unnamed lake. LiDAR imagery suggests that there may be elevated landforms within the target area. Based on surficial geology mapping, the northern tip of the target area lies on lacustrine plain with eolian deposits, while the remainder is also atop lacustrine plain but with organic deposits.
Previously Recorded Archaeological Sites:	There are no sites within 5 km of the target area.

Results

Archaeological Potential Rating:	The target area includes one of the larger lakes in this area that is within the Project footprint. The lake is attached to other lakes in the target area through low-lying, undefined tributaries which could be used as transportation corridors. This chain of lakes continues outside of the Project footprint and appears to connect to the Deh Cho/Mackenzie River by a small tributary, increasing the likelihood that these lakes were visited in the past. These lakes may be a source of fish, game animals, or plant resources. In addition, small, raised landforms are evident in the LiDAR imagery and may have provided dry areas on which to camp. It is for these reasons that the area is presumed to have high archaeological potential. As with other waterbodies, the areas of highest potential are any elevated and dry landforms in proximity to the lakes that would have provided good camping locations.
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Recommendations

The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River) in this target area. SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in the areas of highest

archaeological potential in advance of any potentially land-altering Project activities. These areas are the undisturbed portions of any elevated and dry landforms on the shorelines of the lakes that would have made good camping locations.

No further archaeological work is recommended for areas of low archaeological potential, including previously disturbed lands.

The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Area 14 (Figures 1, 6, and 20)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/10	UTM:	10W 407231 7180157
Area (ha):	398.1	Elevation (masl):	130
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 33.5 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), aspect, and proximity to previously recorded archaeological sites.
Hydrology:	The target area includes an area with multiple unnamed lakes and tributaries present. The Deh Cho/Mackenzie River is located approximately 2.2 km south of the target area at its nearest point. Numerous lakes and tributaries are also present outside of the target area.
Terrain:	The MVWR passes through the target area, as well as a smaller road disturbance. LiDAR/ArcticDEM imagery reveals multiple elevated landforms within the target area, many in the vicinity of lakes or tributaries. Based on surficial geology mapping, the majority of the target area is atop hummocky glaciofluvial deposits, a small area of the western portion of the target area is within lacustrine plain deposits, with the very western edge of the target area being in organic peat deposits.
Previously Recorded Archaeological Sites:	Two sites, LeRo-4, an Indigenous historic campsite, and LeRo-8, an historic camp with trails near a possible fishing lake, are located within the target area.

	<p>Three sites are within 3 km of the target area: sites LeRo-5 and LeRo-7, contemporary campsites located to the south, at the confluence of the unnamed tributary and the Deh Cho/Mackenzie River, and site LeRo-6, a contemporary campsite on a lake to the northeast.</p> <p>Two additional sites are within 5 km of the target area: sites LeRo-1, an historic cabin, and site LeRo-3, a contemporary sawmill.</p>
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Results

Archaeological Potential Rating:	<p>The combination of elevated landforms, which may provide dry camping locations with good viewsheds, in proximity to lakes and tributaries, which may be a good source of various resources as well as providing transportation corridors, suggests that this area has high archaeological potential. The presence of two historic campsites within the target area confirms the high potential of the target area.</p> <p>A portion of this area was previously surveyed for the MGP (permit 2002-916), with 11 negative shovel tests excavated, and for the MVFLP (permits 2014-017 and 2015-002) with a total of 96 negative shovel tests excavated in the target area. It was noted during the MVFLP AIA that the area had low to moderate potential due the terrain elevation (Leyden 2006) and the proximity of lakes and creeks.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any potentially land-altering Project activities. These areas are the undisturbed portions of any elevated and dry landforms on the banks of lakes and creeks that would have made good camping locations. It is also recommended that sites LeRo-4 and LeRo-8 be revisited.</p> <p>No further archaeological work is recommended for areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Target Area 15 (Figures 1, 6, and 20)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/10	UTM:	10W 406522 7178683
Area (ha):	104.6	Elevation (masl):	140
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 35.5 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area focuses on the banks of an unnamed creek. Multiple unnamed lakes and tributaries are present near the target area. The Deh Cho/Mackenzie River is located approximately 1.5 km south of the target area.
Terrain:	LiDAR/ArcticDEM imagery reveals broad, elevated terraces on the banks of the unnamed creek. Multiple linear disturbances pass through the target area. Based on surficial geology mapping the target area falls within colluvial complex deposits along the creek with lacustrine plain and eolian deposits to the west of the creek and hummocky glaciofluvial deposits to the east.
Previously Recorded Archaeological Sites:	<p>Four sites are within 2 km of the target area: sites LeRo-5 and LeRo-7, at the confluence of the unnamed creek and the Deh Cho/Mackenzie River, and sites LeRo-4 and LeRo-8 to the north.</p> <p>Three sites are within 4 km of the target area, on the opposite bank of the Deh Cho/Mackenzie River: sites LeRo-1, LeRo-3, and LeRp-2, a contemporary cabin.</p> <p>One site, LeRo-6, is within 5 km of the target area and is located to the northeast.</p>

Results

Archaeological Potential Rating:	The possibility of high, broad, and dry terraces on the banks of the unnamed creek, which may have been used as a way to access the numerous lakes in the vicinity to and from the Deh Cho/Mackenzie River, suggests that this area has high archaeological potential.
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Recommendations

The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential in advance of any potentially land-altering Project activities. These areas are the undisturbed portions of any elevated and dry terraces the banks of the unnamed creek that would have made good camping locations.

No further archaeological work is recommended for areas of low archaeological potential, including disturbed lands.

The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Area 16 (Figures 1, 7, and 21)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/10	UTM:	10W 410881 7173215
Area (ha):	203.5	Elevation (masl):	125
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 40.8 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area is on the abraded east (right) bank of the Deh Cho/Mackenzie River. Numerous small lakes are present to the east of the target area.
Terrain:	The MVWR is within the target area, as well as numerous smaller linear disturbances. Aerial photographs and satellite and ArcticDEM imagery suggest that high, broad terraces may be present on the bank of the Deh Cho/Mackenzie River. Based on surficial geology mapping, the majority of the target area is within lacustrine plain with organic deposits on the upper terrace. Colluvial complex deposits are present along the Deh Cho/Mackenzie River in the southern half of the target area and slump deposits are present along the Deh Cho/Mackenzie River in the northern half.
Previously Recorded Archaeological Sites:	<p>Site LdRo-15, a contemporary campsite, is within 1 km of the target area, on the bank of an unnamed creek.</p> <p>Site LdRo-1, an historic fort (original Fort Norman, before it was moved to what is now the community of Tulita) is within 2 km of the target area.</p> <p>Site LdRo-14, an Indigenous contemporary cabin, is within 3 km of the target area.</p>

	Site LeRo-1 is located within 5 km of the target area.
	Sites LeRo-1, LdRo-1, and LdRo-14 are all located on the west (opposite) side of the Deh Cho/Mackenzie River.

Results

Archaeological Potential Rating:	The Deh Cho/Mackenzie is a major transportation corridor and landmark, as it is the largest river in this region. Any dry banks or elevated terraces could have made good camping locations and possibly provided a good viewshed of the surrounding area, resulting in high archaeological potential.
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential, which are any dry banks or elevated terraces on the Deh Cho/Mackenzie River, in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>
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Target Area 17 (Figures 1, 7, and 21)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/10	UTM:	10W 411616 7170883
Area (ha):	63.6	Elevation (masl):	120
Ecoregion (Level):	Taiga Plains (I), Taiga Plains (II), Taiga Plains Low Subarctic (III), North Mackenzie Plain Low Subarctic (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 44 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain
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	(including slope and aspect), aspect, and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses the banks of an unnamed tributary of the Deh Cho/Mackenzie River. Numerous small lakes are present in the vicinity of the target area. The Deh Cho/Mackenzie River is approximately 1.5 km west-northwest of the target area.
Terrain:	The MVWR is within the target area, as well as numerous smaller linear disturbances. Aerial photographs and satellite and ArcticDEM imagery suggest that high, broad terraces may be present on the banks of the unnamed creek. Based on surficial geology mapping, colluvial complex deposits are present along the creek itself, and lacustrine plain with organic deposits are present throughout the rest of the target area.
Previously Recorded Archaeological Sites:	<p>Site LdRo-15, a contemporary campsite, is in the target area, on the bank of the unnamed creek.</p> <p>Site LdRo-1 is within 3 km of the target area.</p> <p>Site LdRo-14 is within 4 km of the target area.</p> <p>Sites LdRo-1 and LdRo-14 are located on the west (opposite) side of the Deh Cho/Mackenzie River.</p>

Results

Archaeological Potential Rating:	<p>The possibility of high, broad, and dry terraces on the banks of the unnamed creek, which may have been used as a way to access the numerous lakes in the vicinity, suggests that this area has high archaeological potential. This is supported by the presence of a contemporary campsite in the target area.</p> <p>This creek was surveyed for the MVFLP (permits 2014-017 and 2015-002) with 61 negative shovel tests excavated. During the MVFLP AIA, it was noted that the majority of the area is low/moderate due to wet terrain, but a few dryer, elevated landforms of moderate archaeological potential are present.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential, which are any dry banks or elevated terraces along the creek, in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas previously assessed during the MFVLP or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>
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Target Area 18 (Figures 1, 7, and 21)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/10	UTM:	10W 410726 7166605
Area (ha):	95.4	Elevation (masl):	120
Ecoregion (Level):	Cordillera (I), Taiga Cordillera (II), Low Subarctic (III), Central Mackenzie Plain Low Subarctic boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 46.5 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses a segment of the east bank of the Deh Cho/Mackenzie River, as well as an unnamed tributary and the shores of an unnamed lake. Numerous small lakes and tributaries are present in the vicinity of the target area.
Terrain:	The MVWR is within the target area. ArcticDEM imagery suggests that high, elevated landforms may be present on the banks of the Deh Cho/Mackenzie River, the unnamed tributary, and the unnamed lake. Based on surficial geology mapping, slump deposits are present on the bank of the Deh Cho/Mackenzie River with lacustrine plain with organic deposits along the lake edges. A small area of lacustrine plain that lacks organic deposits is present at the southern end of the target area around the lake and tributary.
Previously Recorded Archaeological Sites:	<p>There are no sites recorded within the target area.</p> <p>Site LdRo-15 is located within Target Area 17 (see above), over 3 km north of Target Area 18.</p> <p>Seven sites are within Target Area 19 (see below), between 3 km to 4 km from the target area: sites LdRo-2, LdRo-3, LdRo-4, LdRo-5, LdRo-7, LdRo-8, LdRo-9.</p> <p>Site LdRo-11, an Indigenous historic cabin, is located within 4 km from the target area to the south, near the confluence of Big Smith Creek and the Deh Cho/Mackenzie River.</p>

Results

Archaeological Potential Rating:	<p>The lake may have resources such as fish, game animals, plant resources present, and the unnamed tributary may be a travel corridor between the lake and the Deh Cho/Mackenzie River. The possibility of dry and elevated landforms on the banks of the Deh Cho/Mackenzie River, the unnamed tributary, and the unnamed lake, which may have been used as camping locations, suggests that this area has high archaeological potential. The proximity of the lake to the Deh Cho/Mackenzie River (approximately 900 m) also increases the likelihood that this lake was visited in the past. Since the target area is placed on the eroding bend of the river, there is good potential for site visibility in the slump deposits.</p> <p>Although target area 18 appears to partially be within the River, this is the result of incorrect water polygons in the LiDAR/ArcticDEM imagery. The target area location is based on orthographic imagery, all fieldwork will be conducted on land</p> <p>A portion of this target area was surveyed for the MVFLP (permits 2014-017 and 2015-002) with one negative shovel test excavated. During the MVFLP, it was noted that the area is of moderate archaeological potential due to the proximity of the river and the lake.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential, which are any dry and elevated landforms along the Deh Cho/Mackenzie River, the unnamed tributary, or the unnamed lake, in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas previously assessed during the MFVLP or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>
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Target Area 19 (Figures 1, 7, and 21)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/10	UTM:	10W 413000 7164090
Area (ha):	219	Elevation (masl):	115
Ecoregion (Level):	Cordillera (I), Taiga Cordillera (II), Low Subarctic (III), Central Mackenzie Plain Low Subarctic boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
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Location:	The proposed MVH target area is located approximately 50.1 km southeast of the community of Tulita, within the Sahtu Settlement Area.
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Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses the banks of Big Smith Creek and a southern tributary of the creek. The Deh Cho/Mackenzie River is approximately 3.2 km west of the target area at its nearest point.
Terrain:	The MVWR is within the target area, as well as a smaller linear disturbance. Aerial photographs and satellite and ArcticDEM imagery suggest that high, broad terraces may be present on the banks of Big Smith Creek. Based on surficial geology mapping, the target area lies within a diverse area. The main channel of Big Smith Creek lies mainly within lacustrine plain and colluvial complex deposits, with a small area of alluvial terrace deposits. The tributary from Big Smith Creek lies primarily within alluvial terrace and lacustrine plain with eolian deposits.
Previously Recorded Archaeological Sites:	<p>Seven sites are within the target area. Sites LdRo-2, a precontact lithic scatter and hearth, and LdRo-3, a precontact isolated find, are located on the east bank of Big Smith Creek.</p> <p>Sites LdRo-4, a precontact campsite with lithic and bone scatter, LdRo-8, a precontact lithic scatter, and sites LdRo-5, LdRo-7, and LdRo-9, all precontact isolated finds, are located on the east bank of Big Smith Creek.</p> <p>Site LdRo-11 is within 4 km of the target area, near the confluence of Big Smith Creek and the Deh Cho/Mackenzie River.</p> <p>Sites LdRo-2, LdRo-3, and LdRo-4 were noted by Ronaghan (2000) on his revisit of the sites as being on terraces of Big Smith Creek. This indicates that raised, dry landforms with high archaeological potential may be present within the target area.</p>

Results

Archaeological Potential Rating:	<p>The large number of sites on the banks of Big Smith Creek and the tributary strongly indicate that the archaeological potential of this target area is high. The areas of highest archaeological potential are any dry and elevated terraces or other landforms along the banks of the creek and tributary that would make good camping or trail locations.</p> <p>This creek was surveyed for the MVWR upgrade programme (1999-892), with 14 negative shovel tests and one positive shovel test excavated, and the MVFLP (permits 2014-017 and 2015-002) with 41 negative shovel tests excavated. The positive shovel test excavated under permit 1999-892 contained bone and fire-cracked rock that was assumed to relate to site LdRo-4. During the AIAs for permits 1999-892, 2014-017, and 2015-002, it was noted that the terraces of Big Smith Creek were of moderate to high archaeological potential.</p>
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Recommendations

The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high potential of the target area, it is recommended that an AIA be conducted in the areas of highest archaeological potential, which are any dry and elevated terraces along the creek and its tributary, in advance of any potentially land-altering Project activities.

No further archaeological work is recommended for areas previously assessed during the MFVLP or in areas of low archaeological potential, including disturbed lands.

The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Area 20 (Figures 1, 8, and 22)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/07	UTM:	10W 415783 7147000
Area (ha):	230.7	Elevation (masl):	115
Ecoregion (Level):	Cordillera (I), Taiga Cordillera (II), Low Subarctic (III), Central Mackenzie Plain Low Subarctic boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 65 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area includes the east bank of the Deh Cho/Mackenzie River and the banks of the two branches of Little Smith Creek.
Terrain:	The MVWR is within the target area, as well as two smaller linear disturbances. Aerial photographs and satellite and LiDAR imagery suggest that high, broad terraces may be present on the banks of the Deh Cho/Mackenzie River and the creek. Based on surficial geology mapping, slump deposits and lacustrine plain with organic deposits are present along the Deh Cho/Mackenzie River. Lacustrine plain with organic deposits are also present on the north bank of Little Smith Creek, while the east bank and southern arm of the creek are

	composed of colluvial complex nearest the creek, with glaciofluvial plain deposits and lacustrine plain deposits abutting the colluvial deposits.
Previously Recorded Archaeological Sites:	<p>Site LcRo-7, a precontact lithic scatter, is located within the target area on the east bank of Little Smith Creek.</p> <p>Three sites are within 1 km of the target area: site LcRo-1, a precontact scatter, is located to northeast of the target area, on an eroding terrace of Little Smith Creek; sites LcRo-3, an Indigenous historic campsite, and LcRo-6, a precontact lithic scatter, are located near the confluence of Little Smith Creek and the Deh Cho/Mackenzie River.</p> <p>Two additional sites are located within 3 km of the target area: sites LcRo-5, an Indigenous historic campsite, and LcRo-8, a precontact campsite, both of which are located near the confluence of the Little Smith Creek and Deh Cho/Mackenzie River.</p>

Results

Archaeological Potential Rating:	<p>The presence of site LcRo-7 within the target area, as well as the numerous sites along the creek that are outside of the Project footprint indicate that this area has high archaeological potential. The areas of highest archaeological potential would be any high, flat, and dry terraces along the Deh Cho/Mackenzie River and Little Smith Creek. Since the target area is placed on the eroding bend of the Deh Cho/Mackenzie River, there is good potential for site visibility in the slump deposits.</p> <p>Although target area 20 appears to be partially within the River, this is the result of incorrect water polygons in the LiDAR/ArcticDEM imagery. The target area location is based on orthographic imagery, all fieldwork will be conducted on land</p> <p>A portion of the target area was surveyed for the MVWR upgrade programme (permit 1999-892), with the excavation of 13 negative shovel tests, the MGP (permits 2002-916 and 2003-933), and the MVFLP (permits 2014-017 and 2015-002) with 29 negative shovel tests excavated. During the AIAs for permits 1999-892, 2002-916, 2014-017, and 2015-002, it was noted that Little Smith Creek had moderate to high potential areas due to the presence of suitable terraces for camping and the proximity of the creek.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of Little Smith Creek in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas previously assessed during the MFVLP or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Target Area 21 (Figures 1, 8, and 22)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/07	UTM:	10W 421589 7141125
Area (ha):	66.6	Elevation (masl):	170
Ecoregion (Level):	Cordillera (I), Taiga Cordillera (II), Low Subarctic (III), Central Mackenzie Plain Low Subarctic boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 72.8 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area includes the banks of an unnamed creek, with the Deh Cho/Mackenzie River approximately 2.7 km southwest of the target area.
Terrain:	The MVWR is within the target area. Aerial photographs and satellite and LiDAR imagery suggest that high, dry landforms may be present on the banks of the creek. Based on surficial geology mapping, the north bank is atop morainal plain and the south bank is atop colluvial complex deposits.
Previously Recorded Archaeological Sites:	Two sites are within 3 km of the target area, near the confluence of the unnamed creek and the Deh Cho/Mackenzie River; sites LcRn-1 and LcRo-2 are both contemporary campsites.

Results

Archaeological Potential Rating:	<p>The areas of highest archaeological potential would be any high and dry landforms along the banks of the unnamed creek.</p> <p>A portion of the target area was surveyed for the MVFLP (permits 2014-017 and 2015-002) with 15 negative shovel tests excavated. During the MVFLP, it was noted that the target area had moderate potential due to the proximity of the creek and the sites.</p>
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Recommendations

The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of the unnamed creek in advance of any potentially land-altering Project activities.

No further archaeological work is recommended for areas previously assessed during the MFVLP or in areas of low archaeological potential, including disturbed lands.

The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Area 22 (Figures 1, 9, and 23)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/07	UTM:	10W 423817 7135208
Area (ha):	57.9	Elevation (masl):	290
Ecoregion (Level):	Cordillera (I), Taiga Cordillera (II), Low Subarctic (III), Central Mackenzie Plain Low Subarctic boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 78.6 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	Small, unnamed lakes and tributaries are present within the target area. The Deh Cho/Mackenzie River is 1.9 km to the south-southwest and the Saline River is 4.7 km to the south-southeast.
Terrain:	Aerial photographs as well as satellite and LiDAR/ArcticDEM imagery suggest that an elevated ridge is present within the target area. This is supported by the recorded elevation of 290 masl, one of the highest points in the Project footprint, and the surficial geology mapping, which reveals the target area to be atop bedrock with morainal veneer.

Previously Recorded Archaeological Sites:	<p>One site, LbRn-12, an historic Indigenous campsite, is within 3 km of the target area to the south, on the bank of the Deh Cho/Mackenzie River.</p> <p>Three sites are in or within 1 km of Target Area 23 (see below), approximately 4 km to 5 km from Target Area 22: sites LbRn-3, LbRn-4, LbRn-5, LbRn-6, and LbRn-8.</p> <p>Two additional sites are within 5 km of Target Area 22: sites LcRn-1 and LcRo-2. These sites are located to the north-northwest, near Target Area 21 (see above), at the confluence of an unnamed creek and the Deh Cho/Mackenzie River.</p>
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Results

Archaeological Potential Rating:	<p>The ridge appears to be unique to the area and may have served as a landmark in the past. It is also the only location with lakes and tributaries in the immediate vicinity, which may have served as an attractive location for resources such as fish and game. The ridge itself may be a source of lithic material. The areas of highest archaeological potential would be any high, broad and dry landforms that would make good camping locations or any areas of exposed, high quality lithic material.</p> <p>A portion of the target area was surveyed for the MGP (permits 2002-916, 2003-933, and 2006-978), with 337 negative shovel tests excavated during permit 2006-978. During the 2006 MGP survey, the area was noted to have moderate archaeological potential.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed dry and broad landforms and exposed high-quality lithic material in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas previously assessed during the 2006 MGP survey or in areas of low archaeological potential, including disturbed lands. The MGP surveys conducted in 2002 and 2003 should be reinvestigated due to the limited shovel testing conducted.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Target Area 23 (Figures 1, 9, and 23)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/07 and 96C/08	UTM:	10W 426956 7130644
Area (ha):	185.6	Elevation (masl):	160
Ecoregion (Level):	Cordillera (I), Taiga Cordillera (II), Low Subarctic (III), Central Mackenzie Plain Low Subarctic boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 84 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area includes the banks of the Saline River, with the Deh Cho/Mackenzie River approximately 300 m west of the target area.
Terrain:	The MVWR is within the target area, as well as an additional linear disturbance. Aerial photographs and satellite and LiDAR/ArcticDEM imagery suggest that high, dry and broad terraces may be present on the banks of the river. Based on surficial geology mapping, the river itself is within alluvial plain deposits, with colluvial complex deposits on the banks nearest the river. In the eastern half of the target area alluvial terrace deposits are present outside of the colluvial complex deposits while in the west of the target area morainal plain is present on the north bank and lacustrine plain deposits are present on the south bank.
Previously Recorded Archaeological Sites:	Three sites are within the target area on the north side of the Saline River: sites LbRn-3, a precontact lithic scatter, LbRn-5, an historic cabin, and LbRn-6, a precontact isolated find. Two sites are within 1 km of the target area, located to the southwest on the banks of the Deh Cho/Mackenzie River: sites LbRn-4, a burial site of undetermined age, and LbRn-8, a precontact burial campsite (although the exact location of this site is unknown). One additional site is within 2 km of the target area, site LbRn-12, an Indigenous historic campsite, located to the northwest, on the bank of the Deh Cho/Mackenzie River.

Results

Archaeological Potential Rating:	<p>The archaeological potential of the area is high due to the presence of three sites within the target area. The river itself is substantial and therefore may have been used as a transportation corridor in the past. The areas of highest archaeological potential would be any high and dry landforms along the banks of the Saline River that would have made good camping locations, especially those near the confluence of the Saline and Deh Cho/Mackenzie rivers.</p> <p>A portion of the target area was surveyed for the MVWR upgrade programme (permit 1999-982), with six negative shovel tests excavated. The MGP (permits 2004-956 and 2006-978) also surveyed a portion of the target area, with four negative shovel tests excavated during the 2004 survey. In addition, the MVFLP (permits 2014-017 and 2015-002) surveyed within the target area, with 7 negative shovel tests excavated. Multiple terraces within a deeply incised valley were noted during the AIA for permit 1999-982. During the 2006 MGP survey, it was noted that the area was of high archaeological potential and detailed AIA investigations were recommended. The area was noted as having moderate potential during the MVFLP due to the proximity to the Saline River.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of the river in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas previously assessed during the MPG or MFVLP studies or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Target Area 24 (Figures 1, 10, and 24)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/01	UTM:	10W 432714 7117434
Area (ha):	338.3	Elevation (masl):	140
Ecoregion (Level):	Cordillera (I), Taiga Cordillera (II), Low Subarctic (III), Central Mackenzie Plain Low Subarctic boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 96 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area includes the banks of the Deh Cho/Mackenzie River and the banks of an unnamed creek, including the confluence of the two. It also includes the banks of a second, smaller unnamed creek that connects to the Deh Cho/Mackenzie River outside of the Project footprint.
Terrain:	The MVWR is within the target area, as well as an additional linear disturbance. Satellite and LiDAR imagery, as well as aerial photographs, suggest that high, dry and broad terraces may be present on the banks of the Deh Cho/Mackenzie River, the creek, and the tributary. Based on this imagery, it also appears that the unnamed tributary may currently be seasonal or dry. Based on surficial geology mapping, the creek itself is within alluvial plain deposits, as well as the bank of the Deh Cho/Mackenzie River to the north, with colluvial complex deposits abutting the alluvial plain. Lacustrine plain with organic deposits is present to the south of the creek, within the target area. Colluvial complex deposits are present along the Deh Cho/Mackenzie River south of the creek and the tributary itself. Lacustrine plain with organic deposits are present to south of the tributary, outside of the colluvial deposits, and lacustrine deposits with glaciofluvial plain are present to the south of the tributary.
Previously Recorded Archaeological Sites:	Four sites are within the target area: sites LbRn-2 and LbRn-10, Indigenous historic campsites, and LbRn-7, a precontact hearth, are on the north side of the creek; site LbRn-1, an Indigenous historic campsite, is located on the south side of the creek. One site is within 1 km of the target area to the east, site LbRn-9, a precontact isolated find.

Results

Archaeological Potential Rating:	<p>The archaeological potential of the confluence of the Deh Cho/Mackenzie River and the unnamed creek is high, as indicated by the presence of four sites within the target area. The creek is also fairly substantial and therefore may have been used as a transportation corridor in the past. The same is true for the tributary; although it currently appears to be dry or ephemeral, it may have been more substantial in the past. The areas of highest archaeological potential would be any high and dry landforms along the banks of the river, the creek, or the tributary that would have made good camping locations.</p> <p>Although target area 24 appears to be partially within the River, this is the result of incorrect water polygons in the LiDAR/ArcticDEM imagery. The target area location is based on orthographic imagery, all fieldwork will be conducted on land</p> <p>A portion of the target area was surveyed for the MGP (permits 2004-956 and 2006-978), with two negative shovel tests excavated during the 2004 survey and 292 negative shovel tests excavated during the 2006 survey, and the MVFLP (permits 2014-017 and 2015-002), with 19 negative shovel tests excavated. During the 2006 MGP survey, the area was noted to have high archaeological potential while the MVFLP target area was described as having moderate potential due to the proximity of the creek.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of the Deh Cho/Mackenzie River and the unnamed creek in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas previously assessed during the 2006 MGP survey and the MFVLP or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>
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Target Area 25 (Figures 1, 10, and 24)

Administrative & Geographic Reference

Land & Water Board:	Sahtu Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	96C/01	UTM:	10W 436137 7107226
Area (ha):	21.6	Elevation (masl):	130
Ecoregion (Level):	Cordillera (I), Taiga Cordillera (II), Low Subarctic (III), Central Mackenzie Plain Low Subarctic boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 108.5 km southeast of the community of Tulita, within the Sahtu Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area includes the west and north shore of an unnamed lake, with the Deh Cho/Mackenzie River approximately 5 km to the west.
Terrain:	A small, linear disturbance abuts the target area. Elevated and dry landforms may be present on the banks of the lake, although these are not obvious in the available imagery. Based on surficial geology mapping, the west bank is within organic deposits with lacustrine plain, while the north and south banks are within lacustrine plain with organic deposits.
Previously Recorded Archaeological Sites:	There are no sites within 5 km of the target area.

Results

Archaeological Potential Rating:	<p>This lake has high archaeological potential as it is one of the larger lakes in the vicinity and may be a source of desirable resources, such as fish, game animals, and plants. The areas of highest archaeological potential would be any elevated and dry landforms that would make good camping locations.</p> <p>Areas to the west of the lake were surveyed during the MGP (2004-956) and the MVFLP (permits 2014-017 and 2015-002). No shovel testing was conducted for either survey. During the MVFLP, the target area was described as having low/moderate potential due to low, wet terrain. However, the MVFLP project assessment area was a narrow footprint, and higher potential landforms that are dry and elevated may be present within the current target area.</p>
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Recommendations

<p>The target area is within the Sahtu Land Use Plan Special Management Zone (SMZ) 63: The Deh Cho (Mackenzie River). SMZ 63 was established to protect water quality, riparian habitat, cultural/heritage sites, and areas important for wildlife and wildlife harvesting. This SMZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the shore of the unnamed lake in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas previously assessed during the MVFLP or in areas of low archaeological potential, including disturbed lands.</p>
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The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Area 26 (Figures 1, 11, and 25)

Administrative & Geographic Reference

Land & Water Board:	Mackenzie Valley Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	95N/16	UTM:	10W 442972 7091630
Area (ha):	381.1	Elevation (masl):	165
Ecoregion (Level):	Cordillera (I), Taiga Cordillera (II), Low Subarctic (III), Central Mackenzie Plain Low Subarctic <i>boreal</i> (IV) to the south of the Blackwater River and Cordillera (I), Boreal Cordillera (II), High Boreal (III), Central Mackenzie Valley High Boreal <i>boreal</i> (IV) to the north of the Blackwater River		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 85 km north-northwest of the community of Wrigley, within the Dehcho Region.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area includes the banks of the Deh Cho/Mackenzie River and the banks of the Blackwater River.
Terrain:	The MVWR is within the target area, as well as numerous additional linear disturbances. Aerial photographs as well as satellite and LiDAR/ArcticDEM imagery suggest that high, dry, and broad terraces may be present on the banks of the Deh Cho/Mackenzie and Blackwater rivers. Based on surficial geology mapping, on the north side of the Blackwater River, lacustrine plain is present at the northernmost point of the target area. This is abutted by colluvial complex which is abutted by alluvial plain as one moves south. An area of slump complex deposits are present where the target area abuts the bank of the Deh Cho/Mackenzie River. On the south side of the Blackwater River, the target area is within glaciofluvial plain deposits.

Previously Recorded Archaeological Sites:	<p>Ten sites are within the target area: contemporary campsites KIRm-2 and KIRm-4; KIRm-5, a cache of undetermined age; KIRm-7, a contemporary shelter; KIRm-9 and KIRm-11, historic trading posts; KIRm-10, an historic cabin; KIRm-12, a burial of undetermined age; and KIRm-13, a precontact lithic scatter, are located on the north side of the Blackwater River; and site KIRm-19, a contemporary cache, is present on the south side of the Blackwater River.</p> <p>Five sites are within 1 km of the target area. Two of these sites, KIRm-16, an Indigenous historic burial campsite, and KIRm-17, an historic cabin, possibly a trading post, are located on the opposite bank of the Deh Cho/Mackenzie River from the target area. The other three sites, KIRm-1, an historic cabin, KIRm-3, a contemporary hearth, and KIRm-6, a contemporary cache, are located to the east, near the Blackwater River.</p> <p>Two sites are within 2 km of the target area; sites KIRm-15, an Indigenous historic campsite, and KIRm-18, a precontact isolated find, are located to the south of the target area.</p>
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Results

Archaeological Potential Rating:	<p>The archaeological potential of the area is high as evidenced by the presence of ten sites within the target area and an additional seven sites within 2 km of the target area. This area most likely attracted people due to the presence of the Blackwater River, which is not only a substantial river that acts as a transportation corridor between the Deh Cho/Mackenzie River and Blackwater Lake, but is also a distinct landmark since the water flowing from it is black. The area was historically well-travelled, with the presence of two trading posts, one established in 1928 and closing around 1931, the second established in 1930 and closing around 1932 (Usher 1971). These trading posts most likely relate to sites KIRm-9 and KIRm-11. The areas of highest archaeological potential are any elevated, dry, and broad terraces along the banks of the Deh Cho/Mackenzie and Blackwater rivers.</p> <p>Although target area 26 appears to be partially within the River, this is the result of incorrect water polygons in the LiDAR/ArcticDEM imagery. The target area location is based on orthographic imagery, all fieldwork will be conducted on land</p> <p>A portion of the target area was surveyed for the MVWR upgrade programme (permit 1999-892) with eight negative shovel tests excavated; the MGP (permits 2003-933, 2004-956 and 2006-978), with 78 negative shovel tests excavated during the 2004 survey and 25 negative shovel tests excavated during 2006 survey; and the MVFLP (permits 2014-017 and 2015-002) with 49 negative shovel tests excavated. Ronaghan (2000) indicates low archaeological potential in the area assessed for permit 1999-982, noting the river valley is shallow, with considerable flooding and overbank deposits. However, during the MGP and MVFLP surveys the target area was noted as having moderate to high potential due to the historic use of the area, the proximity of the Blackwater River, and the presence of prominent landforms.</p>
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Recommendations

This target area is within the Dehcho Land Use Plan Conservation Zone (CZ) 4: Pehdzeh Ki Ndeh. CZ 4 is considered to have significant ecological and cultural value. This CZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of the Deh Cho/Mackenzie and Blackwater rivers in advance of any potentially land-altering Project activities.

No further archaeological work is recommended for areas previously assessed during the 2006 MGP survey and the MFVLP or in areas of low archaeological potential, including disturbed lands.

The field assessment will also evaluate, define, and modify the areas of high archaeological potential.

Target Areas 27 and 28 (Figures 1, 12, and 26)

Administrative & Geographic Reference

Land & Water Board:	Mackenzie Valley Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	TA 27: 95N/16 TA 28: 95O/13	UTM:	TA 27: 10W 448653 7083360 TA 28: 10W 451071 7077006
Area (ha):	TA 27: 135.9 TA 28: 31	Elevation (masl):	TA 27: 165 TA 28: 125
Ecoregion (Level):	Cordillera (I), Boreal Cordillera (II), High Boreal (III), Central Mackenzie Valley High Boreal boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 71 to 75 km north-northwest of the community of Wrigley, within the Dehcho Settlement Area.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses the east banks of the Deh Cho/Mackenzie River in the areas where the Project footprint passes close to the river.
Terrain:	Based on surficial geology mapping, a small area on the northern portion of Target Area 27 is within alluvial terrace deposits, while the rest of the two target areas are within glaciofluvial plain deposits.
Previously Recorded Archaeological Sites:	Two sites are within 5 km of Target Area 27 to the north, on the bank of the Deh Cho/Mackenzie River: sites KIRm-15 and KIRm-18.

	No archaeological sites are within 5 km of Target Area 28.
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Results

Archaeological Potential Rating:	<p>The Deh Cho/Mackenzie River is a major transportation corridor in the region and it was likely used extensively in the past and is therefore of high archaeological potential. In addition, desirable resources such as fish, game animals, and various plants are present along the Deh Cho/Mackenzie River. The areas of highest archaeological potential would be any high and dry landforms along the banks of the river that would have made good camping locations and provided a good viewshed. Since the target area is placed on the eroding bend of the river, there is good potential for site visibility in the eroding soils.</p> <p>Although target area 27 appears to be partially within the River, this is the result of incorrect water polygons in the LiDAR/ArcticDEM imagery. The target area location is based on orthographic imagery, all fieldwork will be conducted on land</p> <p>An area to the east of the target areas was surveyed by the MVFLP (permits 2014-017 and 2015-002) with 81 negative shovel tests excavated in three locations. These tested areas were noted to have moderate potential due to the presence of an unnamed creek and prominent landforms in the area. Similar landforms may be closer to the Mackenzie River and therefore have higher archaeological potential than those encountered during the MVFLP.</p>
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Recommendations

<p>This target area is within the Dehcho Land Use Plan Conservation Zone (CZ) 4: Pehdzeh Ki Ndeh. CZ 4 is considered to have significant ecological and cultural value. This CZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of the Deh Cho/Mackenzie River in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>
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Target Area 29 (Figures 1, 12, and 26)

Administrative & Geographic Reference

Land & Water Board:	Mackenzie Valley Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	95O/13	UTM:	10W 452795 7073609
Area (ha):	201.8	Elevation (masl):	200
Ecoregion (Level):	Cordillera (I), Boreal Cordillera (II), High Boreal (III), Central Mackenzie Valley High Boreal boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
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Location:	The proposed MVH target area is located approximately 65.8 km north-northwest of the community of Wrigley, within the Dehcho Region.
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Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses the banks of an unnamed creek that connects to the Deh Cho/Mackenzie River, as well as a small area along the east bank of the Deh Cho/Mackenzie River.
Terrain:	The MVWR is within the target area. Aerial photographs and satellite and LiDAR/ArcticDEM imagery suggest that high, dry and broad terraces may be present on the banks of the creek. Based on surficial geology mapping, the area nearest the Deh Cho/Mackenzie River is within alluvial terrace deposits, grading to slump with colluvial complex deposits in the south. The creek is primarily colluvial complex deposits with lacustrine plain and organic deposits on either side. A small area of glaciofluvial plain is present between the alluvial deposits to the west and lacustrine deposits to the east.
Previously Recorded Archaeological Sites:	There are no recorded sites within 5 km of the target area.

Results

Archaeological Potential Rating:	<p>The unnamed creek is a somewhat substantial creek and therefore may have been used as a transportation corridor in the past. The areas of highest archaeological potential would be any high and dry landforms along the banks of the creek that would have made good camping locations.</p> <p>A portion of the target area was assessed for the MVFLP (permits 2014-017 and 2015-002) with 31 negative shovel tests excavated. It was noted during the MVFLP that the area was of moderate potential due to the proximity of the creek and the presence of defined landforms.</p>
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Recommendations

<p>This target area is within the Dehcho Land Use Plan Conservation Zone (CZ) 4: Pehdzeh Ki Ndeh. CZ 4 is considered to have significant ecological and cultural value. This CZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of the unnamed creek in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for the area surveyed during the MVFLP or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Target Area 30 (Figures 1, 13, and 27)

Administrative & Geographic Reference

Land & Water Board:	Mackenzie Valley Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	95O/12	UTM:	10W 458470 7062202
Area (ha):	363.8	Elevation (masl):	200
Ecoregion (Level):	Cordillera (I), Boreal Cordillera (II), High Boreal (III), Central Mackenzie Valley High Boreal <i>boreal</i> (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 46.5 km north-northwest of the community of Wrigley, within the Dehcho Region.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area includes the confluence of the Deh Cho/Mackenzie River and Strawberry and Dam creeks, as well as the Deh Cho/Mackenzie River and an unnamed creek. It also includes portions of the east bank of the Deh Cho/Mackenzie River and the banks of Dam Creek and the unnamed creek within the Project footprint.
Terrain:	The MVWR is within the majority of the target area, as well as an additional linear disturbance in some areas. Aerial photographs and satellite and LiDAR/ArcticDEM imagery suggest that high, dry and broad terraces may be present on the banks of the creeks. Based on surficial geology mapping, the area nearest the Deh Cho/Mackenzie River is within alluvial terrace deposits, with slump deposits at the northernmost point of the target area. The creeks contain colluvial complex deposits with lacustrine plain deposits on either side.
Previously Recorded Archaeological Sites:	<p>Three sites are within the target area: site KkRI-1, a precontact isolated find, is located on the northern unnamed creek, and sites KkRI-2, a contemporary trap, and KkRI-5, a precontact isolated find, are located on either side of Dam Creek.</p> <p>Two sites are within 1 km of the target area: sites KkRI-3 and KkRI-4, both contemporary campsites, are located east of the target area on the banks of Dam Creek.</p> <p>One site, KkRI-6, a precontact lithic scatter, is located within 2 km of the target area, on the opposite bank of the Deh Cho/Mackenzie River.</p>

Results

Archaeological Potential Rating:	<p>Due to inconsistencies in the records, with site KkRI-1 noted as being a precontact microblade core and three blade flakes in Millar et al. (1985) and as an isolated find of undetermined age in the archaeological site data provided by PWNHC, it was determined that the site area, and the banks of the unnamed creek on which it was found, should be reassessed. It was also noted during the AIA for permit 1973-334 that the site was identified in an eroding terrace slope, suggesting there may be good camping locations in the vicinity of this creek. Similarly, the presence of one archaeological site and three contemporary sites on the banks of Dam Creek indicate that dry, broad, and elevated landforms suitable for camping are present along the banks of the river. No sites are present near Strawberry Creek; however, the imagery suggests that the valley is deeply incised with the presence of raised landforms. These elevated landforms on the banks of the creeks and any located on the Deh Cho/Mackenzie River have the highest archaeological potential.</p> <p>The unnamed creek on which site KkRI-1 is located was surveyed for the MVWR upgrade programme (permit 1999-982) and was noted to have low archaeological potential due to steeply sloping terrain. However, the exact location of the survey area is unknown and higher potential areas may be present in the vicinity. A portion of the target area was assessed for the MGP (permits 2002-916, 2003-933, and 2006-978) with nine negative shovel tests excavated under permit 2003-916 and 46 negative shovel tests excavated under permit 2006-978. It was noted during the 2006 AIA that the area north of Dam Creek was of low archaeological potential. However, the MGP footprint for permit 2006-978 is further back from the creek, where as Target Area 30 is located on the creek banks, which can be easily accessed from the creek and may provide a good viewshed of the surrounding area. Therefore, the target area may have higher archaeological potential than the area assessed under permit 2006-978. The MVFLP (permits 2014-017 and 2015-002) also surveyed within the target area, with 88 negative shovel tests excavated at various locations along the MVFLP footprint, primarily along drainages. It was noted during the MVFLP that the areas were of moderate potential, including the north bank of Dam Creek, due to the proximity of the creek and the presence of defined landforms.</p>
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Recommendations

<p>This target area is within the Dehcho Land Use Plan Conservation Zone (CZ) 4: Pehdzeh Ki Ndeh. CZ 4 is considered to have significant ecological and cultural value. This CZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of the Deh Cho/Mackenzie River and the creeks in advance of any potentially land-altering Project activities. It is also recommended that the sites within the target area are revisited.</p> <p>No further archaeological work is recommended for the area surveyed for permits 2006-978, 2014-017, and 2015-002 or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>
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Target Area 31 (Figures 1, 14, and 28)

Administrative & Geographic Reference

Land & Water Board:	Mackenzie Valley Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	95O/12	UTM:	10W 463429 7046722
Area (ha):	290.1	Elevation (masl):	180
Ecoregion (Level):	Cordillera (I), Boreal Cordillera (II), High Boreal (III), Central Mackenzie Valley High Boreal <i>boreal</i> (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 36.3 km north-northwest of the community of Wrigley, within the Dehcho Region.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area includes the confluence and banks of the Deh Cho/Mackenzie River and White Sand Creek. The confluence and banks of the Deh Cho/Mackenzie River and an unnamed creek are also within the target area. Small lakes are present outside of the Project footprint to the east.
Terrain:	The MVWR is within the majority of the target area, as well as an additional linear disturbance in some areas. Aerial photographs and satellite and LiDAR/ArcticDEM imagery suggest that high, dry and broad terraces may be present on the banks of the creeks. Based on surficial geology mapping, the area nearest the Deh Cho/Mackenzie River and the western half of the creeks is primarily within alluvial terrace deposits, with alluvial plain deposits along White Sands Creek and the bank of the Deh Cho/Mackenzie River between White Sand Creek and the unnamed creek. Colluvial complex deposits abut the alluvial plain along White Sand Creek. The remainder of the target area is atop lacustrine plain deposits.
Previously Recorded Archaeological Sites:	Eight sites are within the target area: site KjRI-6, a precontact isolated find, is located on the north bank of the unnamed creek, while sites KjRI-1, KjRI-3, and KjRI-4, precontact lithic scatters, KjRI-2 and KjRI-5, precontact isolated finds, KjRI-8, a contemporary campsite, and KjRI-9, a contemporary trail, are on the banks of White Sand Creek.

Results

Archaeological Potential Rating:	<p>The northern unnamed creek is of high archaeological potential as indicated by the presence of site KjRI-6, revealing that this area was used in the past. Similarly, the presence of eight sites along White Sand Creek further indicate that this creek was used in the past, possibly as a transportation corridor. Millar et al. (1985) note the presence of high terraces on the banks of this creek which suggests, in combination with the high number of archaeological sites, that good camping locations are present along this creek. Any elevated landforms on the banks of the creeks and on the Deh Cho/Mackenzie River have the highest archaeological potential.</p> <p>The unnamed creek was surveyed for the MVWR upgrade programme (permit 1999-982) and was noted to have low to moderate potential due to the presence of a sloping terrace. An additional portion of the target area was assessed for the MGP (permits 2002-916 and 2006-978) with 34 negative shovel tests excavated under permit 2006-978. It was noted during the 2006 AIA that the area is of low to high potential. The MVFLP (permits 2014-017 and 2015-002) also surveyed within the target area, with a total of 43 negative shovel tests excavated on either side of White Sand Creek. White Sand Creek was further noted to have moderate archaeological potential due to prominent landforms and the proximity of the creek.</p>
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Recommendations

<p>This target area is within the Dehcho Land Use Plan Conservation Zone (CZ) 4: Pehdzeh Ki Ndeh. CZ 4 is considered to have significant ecological and cultural value. This CZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of the Deh Cho/Mackenzie River and the creeks in advance of any potentially land-altering Project activities. It is also recommended that the sites within the target area are revisited.</p> <p>No further archaeological work is recommended for the area surveyed for permits 2014-017 and 2015-002 or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Target Area 32 (Figures 1, 14, and 28)

Administrative & Geographic Reference

Land & Water Board:	Mackenzie Valley Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	95O/05	UTM:	10W 466131 7038204
Area (ha):	232.7	Elevation (masl):	145
Ecoregion (Level):	Cordillera (I), Boreal Cordillera (II), High Boreal (III), Central Mackenzie Valley High Boreal boreal (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
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Location:	The proposed MVH target area is located approximately 36.3 km north-northwest of the community of Wrigley, within the Dehcho Region.
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Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses the banks of the Ochre River, with the Deh Cho/Mackenzie River approximately 250 m west of the target area. Small, unnamed lakes are present to the east of the Project footprint.
Terrain:	The MVWR is within the target area, as well as additional linear disturbances in some areas. Aerial photographs and satellite and LiDAR/ArcticDEM imagery suggest that high, dry and broad terraces may be present on the banks of the river. Based on surficial geology mapping, colluvial complex deposits are present along the creek, with alluvial terrace in the western half of the target area and lacustrine plain deposits in the eastern half, outside of the creek valley.
Previously Recorded Archaeological Sites:	<p>Six sites are present within the target area: sites KiRI-1, a precontact isolated find; KiRI-2, an historic cache; KiRI-3, a precontact flint station (most likely a lithic workshop); KiRI-4, an Indigenous historic cabin; KiRI-6, a precontact flint station (lithic workshop); and KiRI-7, a precontact lithic scatter.</p> <p>Three sites are within 1 km of the target area: sites KiRI-5, a precontact campsite, KiRI-8, an historic cabin, and KiRI-9, a contemporary trap, are located to the north and west, along the bank of the Deh Cho/Mackenzie River.</p> <p>All sites are located on the north side of the Ochre River, apart from site KiRI-2, which is located on the south side.</p>

Results

Archaeological Potential Rating:	<p>The Ochre River is of high archaeological potential, especially the north bank, as evidenced by the presence of five sites within the target area, spanning the precontact and historic period, which indicates that this area was used heavily in the past. Millar et al. (1985) note the presence of high terraces on the banks of the river, which suggests, in combination with the high number of archaeological sites, that good camping locations are present within the target area. These elevated terraces would have the highest archaeological potential.</p> <p>A portion of the target area was assessed for the MVWR upgrade programme (permit 1999-892), with nine negative shovel tests excavated. A series of terraces above the river were noted at the time. The MGP (permits 2003-933 and 2006-978) surveyed portions of the target area, with 70 negative shovel tests excavated under permit 2003-933 and 24 negative shovel tests excavated under permit 2006-978. It was noted during the 2006 AIA that the area is of low to moderate potential. The MVFLP (permits 2014-017 and 2015-002) also surveyed within the target area, with a total of 53 negative shovel tests excavated on the north side of Ochre River. It was noted during the MVFLP that the area had low potential in some areas due to</p>
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	previous disturbance, while the remaining area had moderate potential due to prominent landforms and the proximity to the river.
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Recommendations

<p>This target area is within the Dehcho Land Use Plan Conservation Zone (CZ) 4: Pehdzeh Ki Ndeh. CZ 4 is considered to have significant ecological and cultural value. This CZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of the Ochre River in advance of any potentially land-altering Project activities. It is also recommended that the sites within the target area are revisited.</p> <p>No further archaeological work is recommended for the area surveyed for permits 2006-978, 2014-017, and 2015-002 or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Target Area 33 (Figures 1, 15, and 29)

Administrative & Geographic Reference

Land & Water Board:	Mackenzie Valley Land and Water Board	Land Use Permit:	N/A
1:50K NTS Map:	95O/05	UTM:	10W 470570 7028679
Area (ha):	77.3	Elevation (masl):	215
Ecoregion (Level):	Cordillera (I), Boreal Cordillera (II), High Boreal (III), Central Mackenzie Valley High Boreal <i>boreal</i> (IV)		

Development Description

Development Type:	Project activities are planned for winter 2020 to 2025. Project activities will include pre-construction assessment (including geotechnical assessments) and access road construction activities (including vegetation removal, grading, aggregate extraction, etc.).
Location:	The proposed MVH target area is located approximately 18.2 km north-northwest of the community of Wrigley, within the Dehcho Region.

Archaeological Potential

Methods:	This overview is based on a desktop review of available information sources including previous permit reports, topographic maps, aerial photography, ethnographic and archaeological records and historic information. Our assessment of the archaeological potential of the MVH target area is based, in part, on the following attributes: hydrology, terrain (including slope and aspect), and proximity to previously recorded archaeological sites.
Hydrology:	The target area encompasses the banks of Philips Creek, with the Deh Cho/Mackenzie River approximately 3 km west at its nearest point and multiple unnamed lakes present to the east of the target area.
Terrain:	The MVWR is within the very eastern extent of the target area, as is an additional linear disturbance that passes through the western half of the target area. Aerial photographs and satellite and LiDAR imagery suggest that elevated landforms may be present on the banks of

	the creek. Based on surficial geology mapping, the majority of the target area falls within lacustrine plain with morainal drumlinoid deposits, with a small area in the southeast lacking the morainal drumlinoid deposits. The southern quarter of the target area falls within colluvial complex deposits.
Previously Recorded Archaeological Sites:	There are no sites within 5 km of the target area.

Results

Archaeological Potential Rating:	The banks of the unnamed creek are of high archaeological potential due to the possible presence of dry, elevated landforms that would have made good camping locations. In addition, Philips Creek connects to the Deh Cho/Mackenzie River and runs parallel to a bedrock outcrop, most likely associated with Mount Gaudet, therefore acting as a transportation corridor between the two locations. The creek also leads to multiple small, unnamed lakes located to the east of the target area. These might have been good locations for various resources such as plants, game animals, and fish, further increasing the potential that this creek was utilized as a transportation corridor in the past. A portion of the target area, along the MVWR, was assessed for the MVFLP (permits 2014-017 and 2015-002). The area was noted to have low to moderate archaeological potential due to the height of the terrain (Leyden 2016).
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Recommendations

<p>This target area is within the Dehcho Land Use Plan Conservation Zone (CZ) 4: Pehdzeh Ki Ndeh. CZ 4 is considered to have significant ecological and cultural value. This CZ has potential for traditional land use sites. Based on the high archaeological potential of the target area, it is recommended that an AIA be conducted in areas of undisturbed elevated and dry landforms on the banks of Philips Creek in advance of any potentially land-altering Project activities.</p> <p>No further archaeological work is recommended for the area surveyed for permits 2014-017, and 2015-002 or in areas of low archaeological potential, including disturbed lands.</p> <p>The field assessment will also evaluate, define, and modify the areas of high archaeological potential.</p>

Study Limitations

This document was prepared by Stantec Consulting Ltd. at the request of the proponent relative to their obligations under the *Archaeological Sites Act*, the *Archaeological Sites Regulations*, the *Mackenzie Valley Land Use Regulations*, and the *Historical Resources Act*. The material in it reflects Stantec's best judgment in light of the information available at the time of preparation. Any use that a third party makes of this report, or any reliance on or decisions made based on it, are the responsibility of such third parties. Stantec is not responsible for any unauthorized use or modification of this document.

The findings of this study pertain only to the Project as outlined within this report. Any changes or additions to the Project must be reviewed in terms of historical resource concerns and the potential need for further assessment.

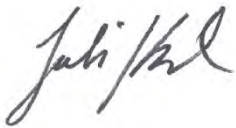
This AOA is based on the study area provided by the GNWT INF. It is assumed that any activities that occur prior to a pre-impact archaeological impact assessment will be limited to areas of low archaeological potential.

Archaeological and historical sites older than 50 years are protected from unpermitted disturbances, alterations or surveys under the *Archaeological Sites Act*, whether they are located on public or private land. Settlement area land use plans and Territorial regulations and legislation may further restrict activities within the proximity of known or suspected archaeological resources.

To address the discovery of any unanticipated archaeological remains, it is recommended that the proponent inform their personnel and contractors that, in the event that possible archaeological materials are encountered, all Project activities in the vicinity of the archaeological remains must be suspended immediately and the relevant land use board must be notified.

The present AOA was designed solely to identify and assess evidence of past human activity protected under the *Archaeological Sites Act*. It is not the intent of this report to evaluate traditional aboriginal use; nor is the intent to address potential impacts to non-protected cultural heritage resources within the proposed Project footprint areas.

This information is to be used to assist in planning the proposed project only. It is not to be disseminated without written permission of the Prince of Wales Northern Heritage Centre.



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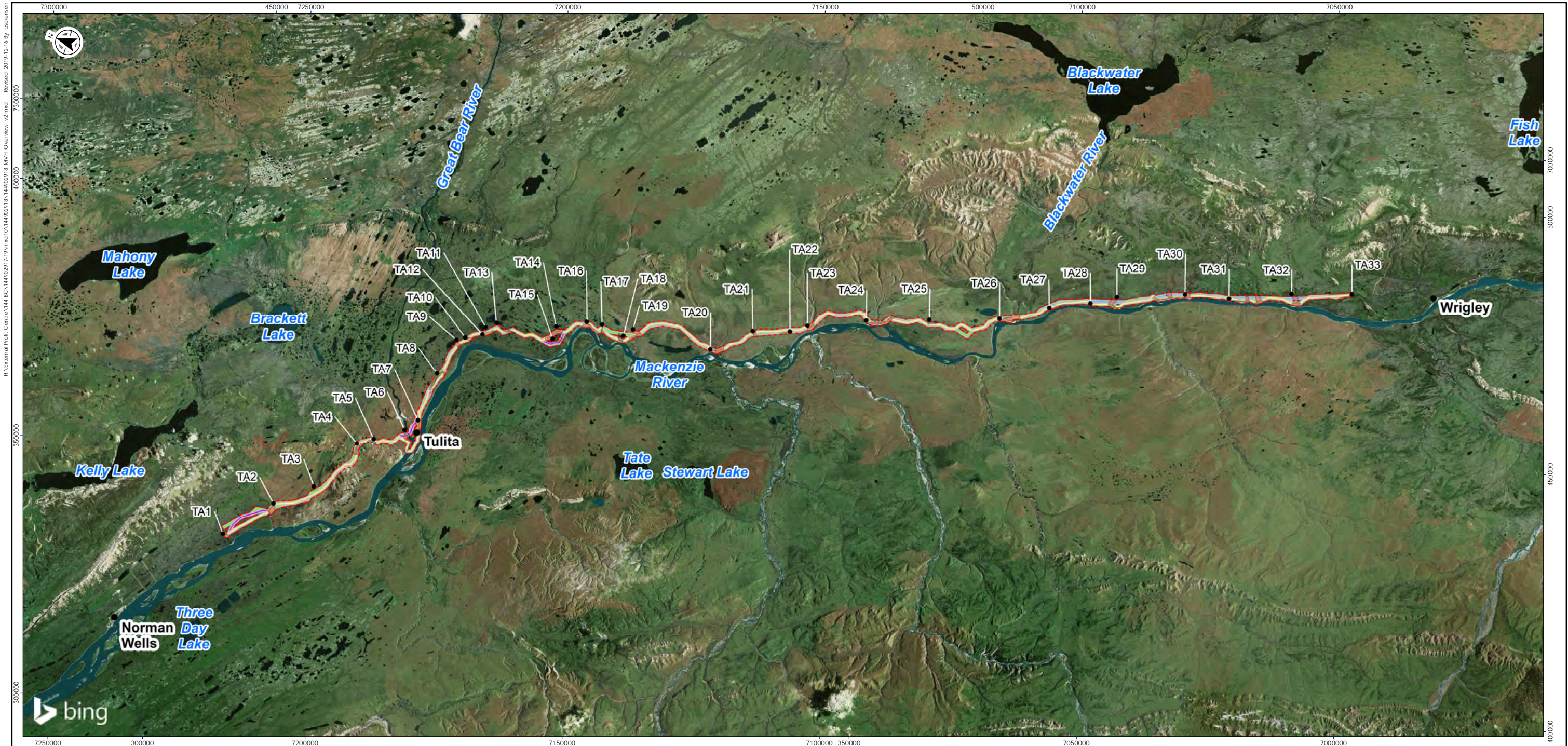
March 9, 2020

Dated

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- Mackenzie Valley Highway Section (Proposed)
- 2012 Proposed Mackenzie Valley Highway Extension – Dehcho Region
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- 1974 Public Works Canada Alignment
- AOA Evaluation Footprint
- Target Area (TA)

Notes
1. Coordinate System: NAD 1983 UTM Zone 10N
2. Source: CanVec produced Natural Resources Canada Service Layer Credits: ©
2019 Microsoft Corporation Earthstar Geographics SIO
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,
NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China
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Project Location: Central NWT
Prepared by B.Sorensen on 2019-12-13

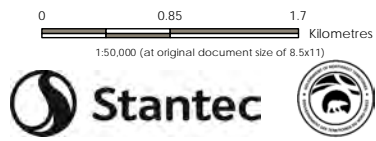
Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway Project

Figure No.
1
Title
**Mackenzie Valley Highway AOA
Evaluation Footprint**



- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Archaeological Site
- Surveyed Area (Permit 2016-004)
- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2004-956)

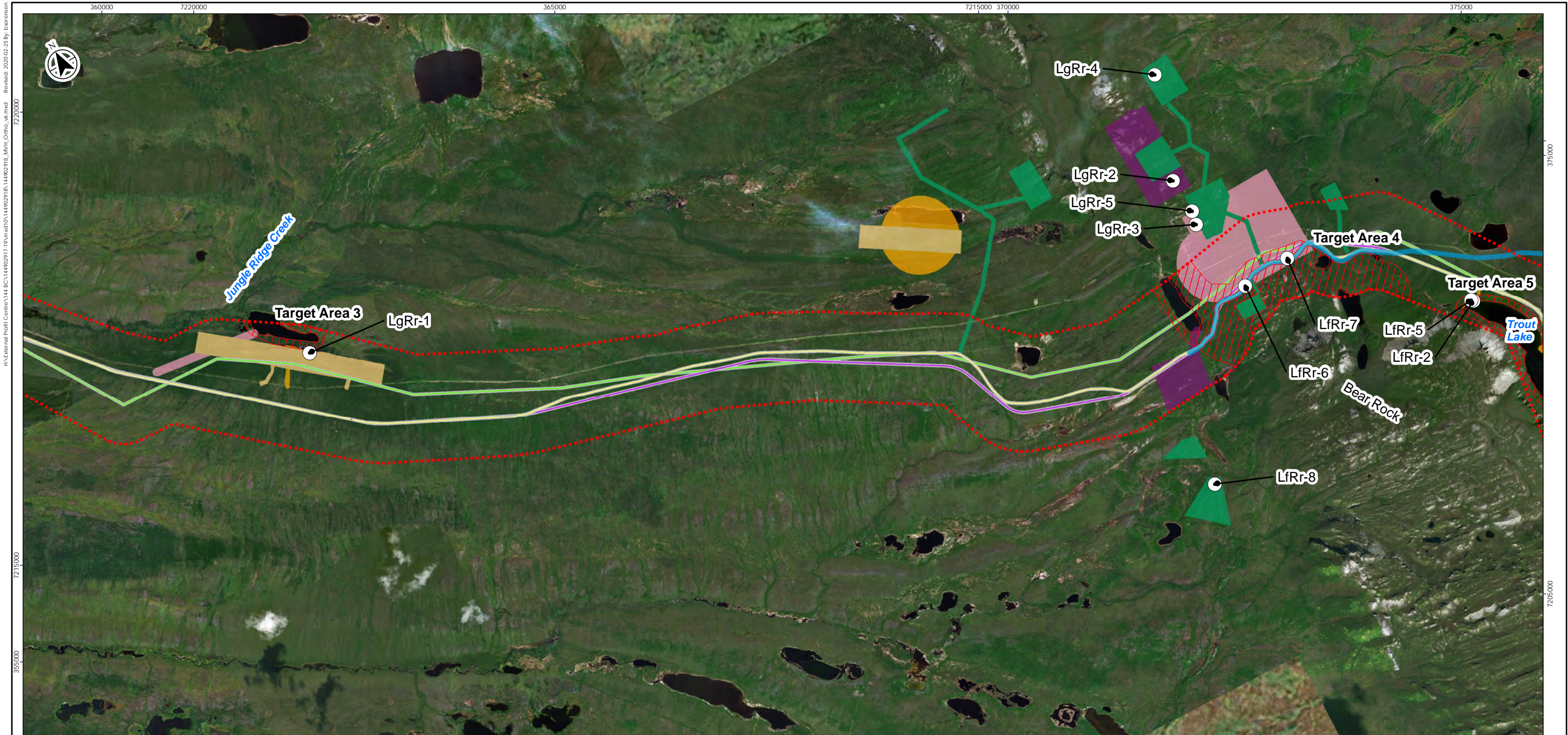
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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,
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Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

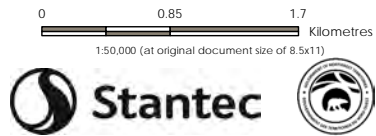
Figure No. 2
Title
Orthographic Map of Mackenzie
Valley Highway AOA Evaluation
Footprint and Target Areas



- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

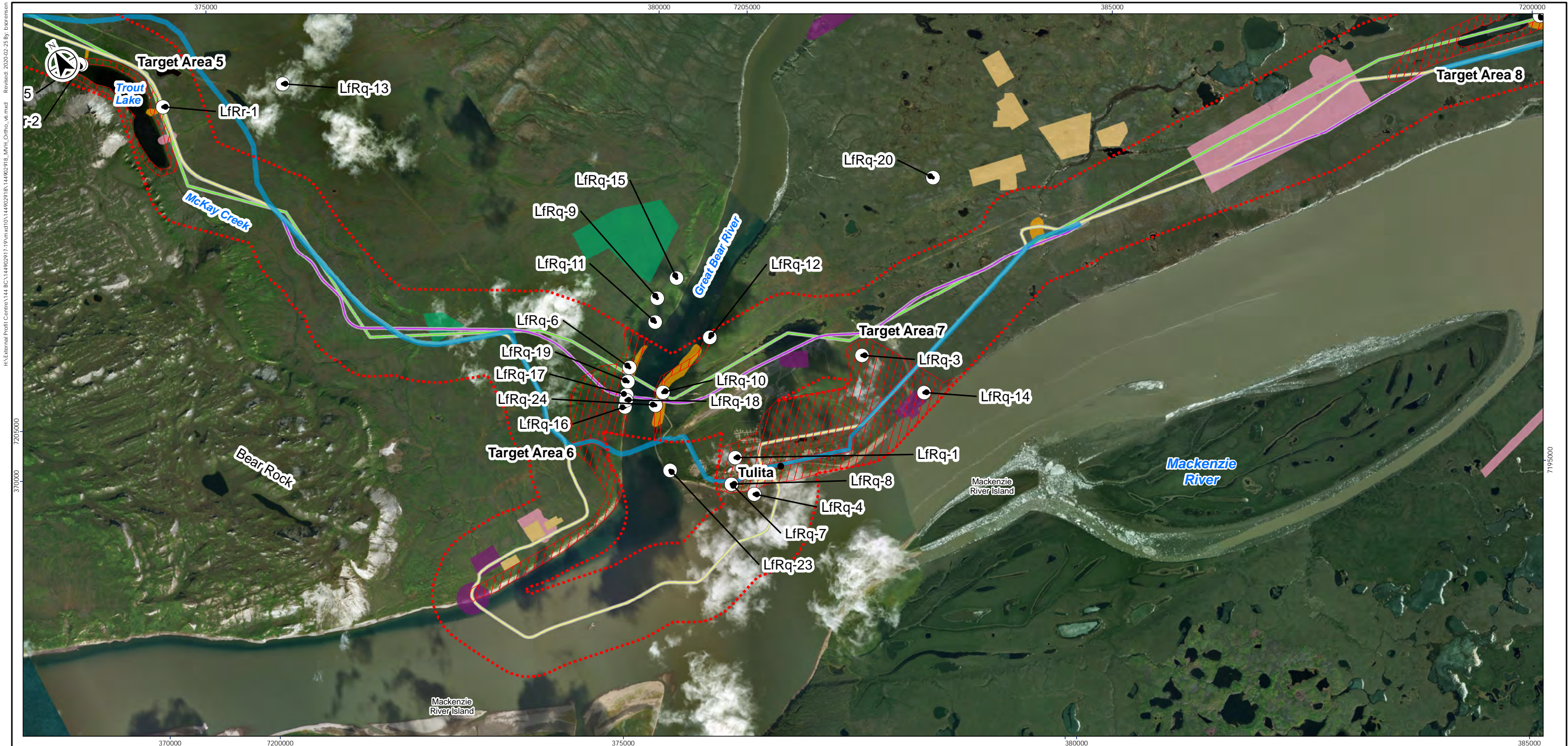
- Surveyed Area (Permit 2016-004)
- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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Project Location
Central NWT
Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. 3
Title
Orthographic Map of Mackenzie Valley Highway AOA Evaluation Footprint and Target Areas

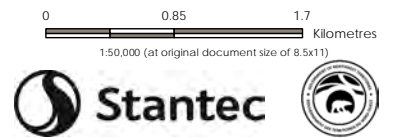


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

- Surveyed Area (Permit 2016-004)
- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,
NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China
(Hong Kong), Swisstopo, Mapbox, and the GIS User Community
3. Archaeological Site Data provided by the Prince of Wales Northern Heritage
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Project Location
Central NWT
Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
4
Title

**Orthographic Map of Mackenzie
Valley Highway AOA Evaluation
Footprint and Target Areas**

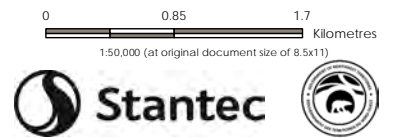


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,
NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China
(Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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Project Location
Central NWT
Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
5
Title

Orthographic Map of Mackenzie
Valley Highway AOA Evaluation
Footprint and Target Areas

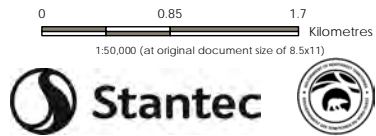


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

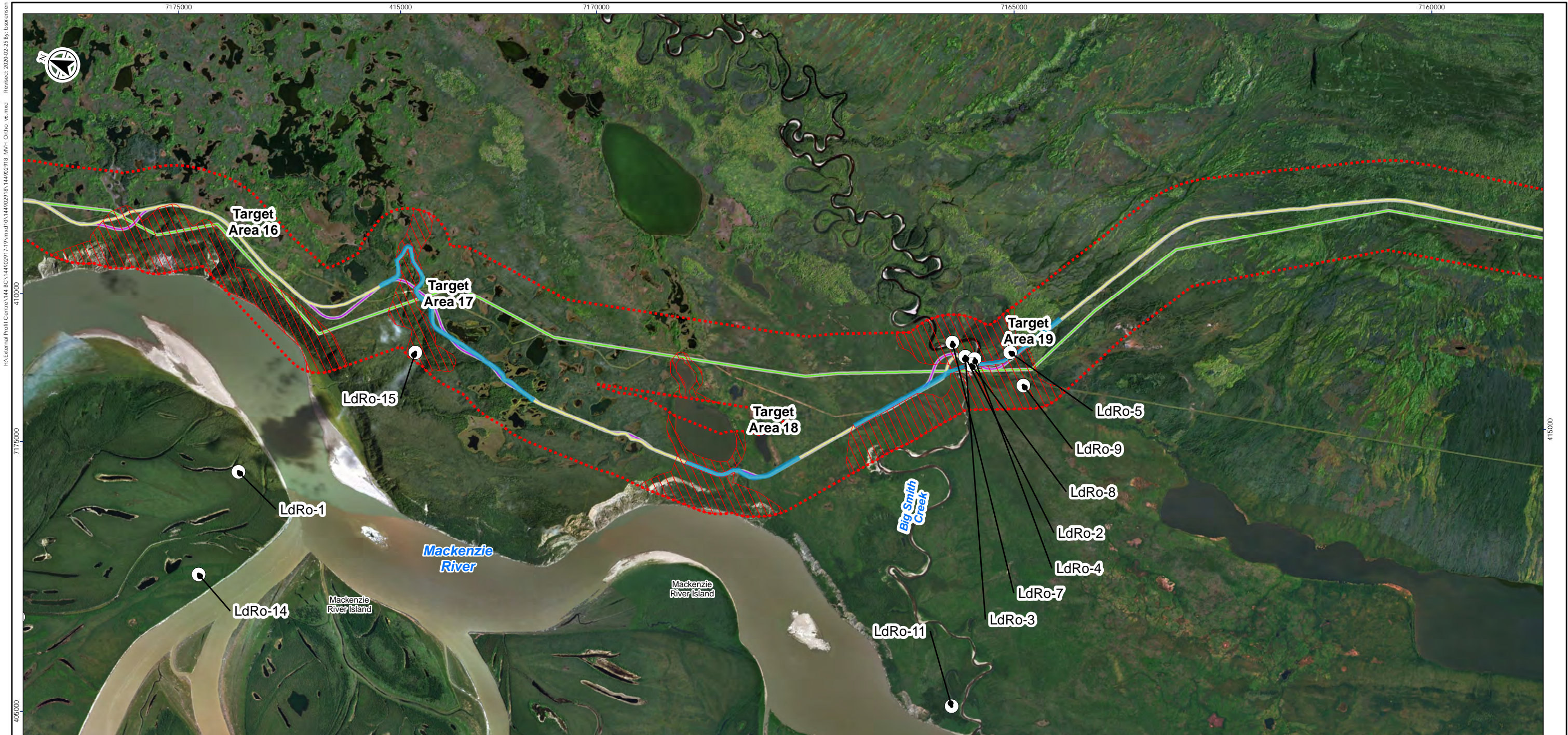
Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,
NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China
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Project Location
Central NWT
Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
6
Title
Orthographic Map of Mackenzie Valley Highway AOA Evaluation Footprint and Target Areas

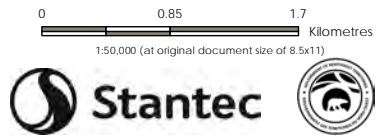


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

Surveyed Area (Permits 2014-017 & 2015-002)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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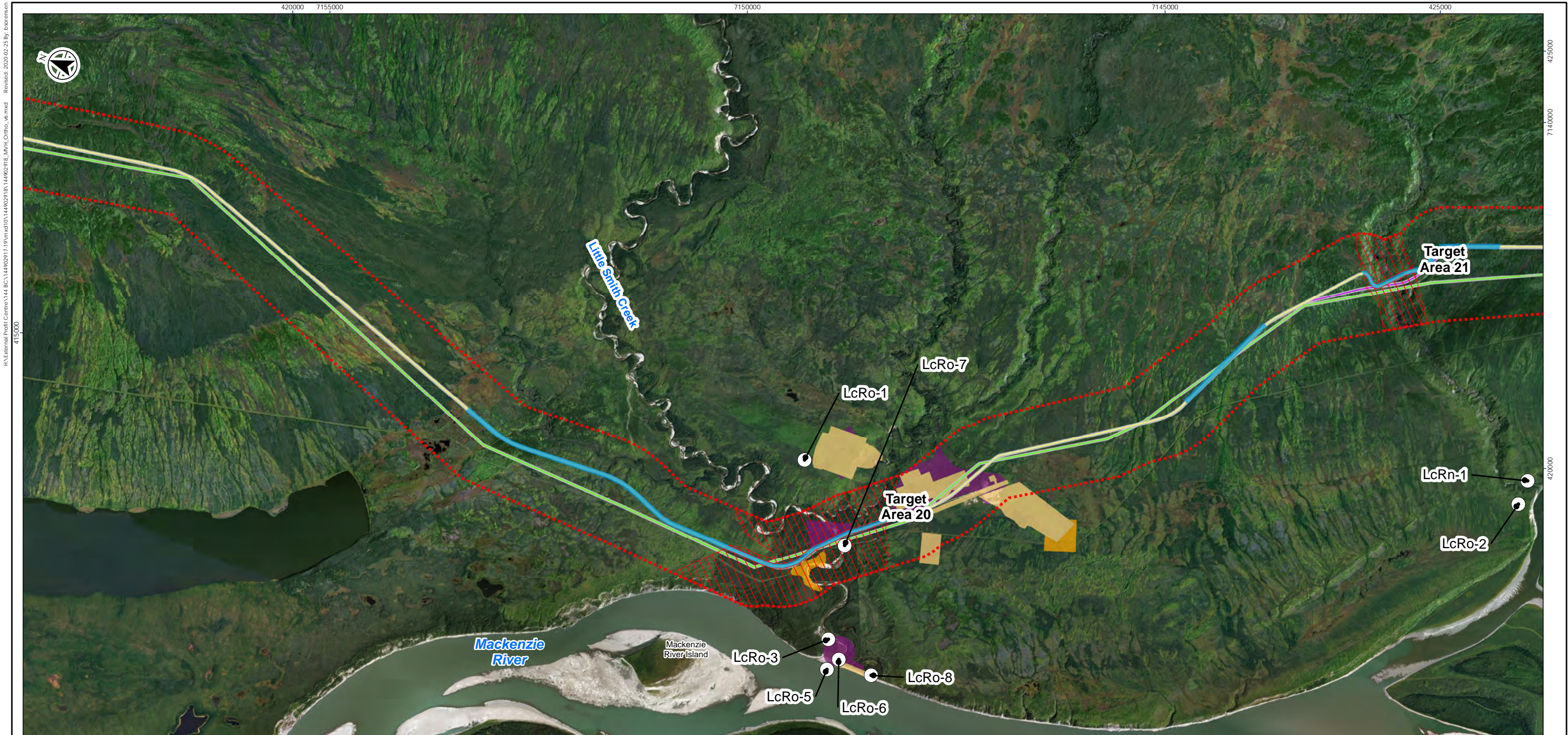


Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
7
Title

Orthographic Map of Mackenzie Valley Highway AOA Evaluation Footprint and Target Areas

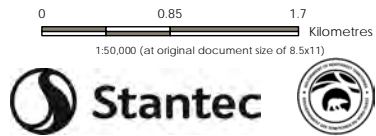


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,
NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China
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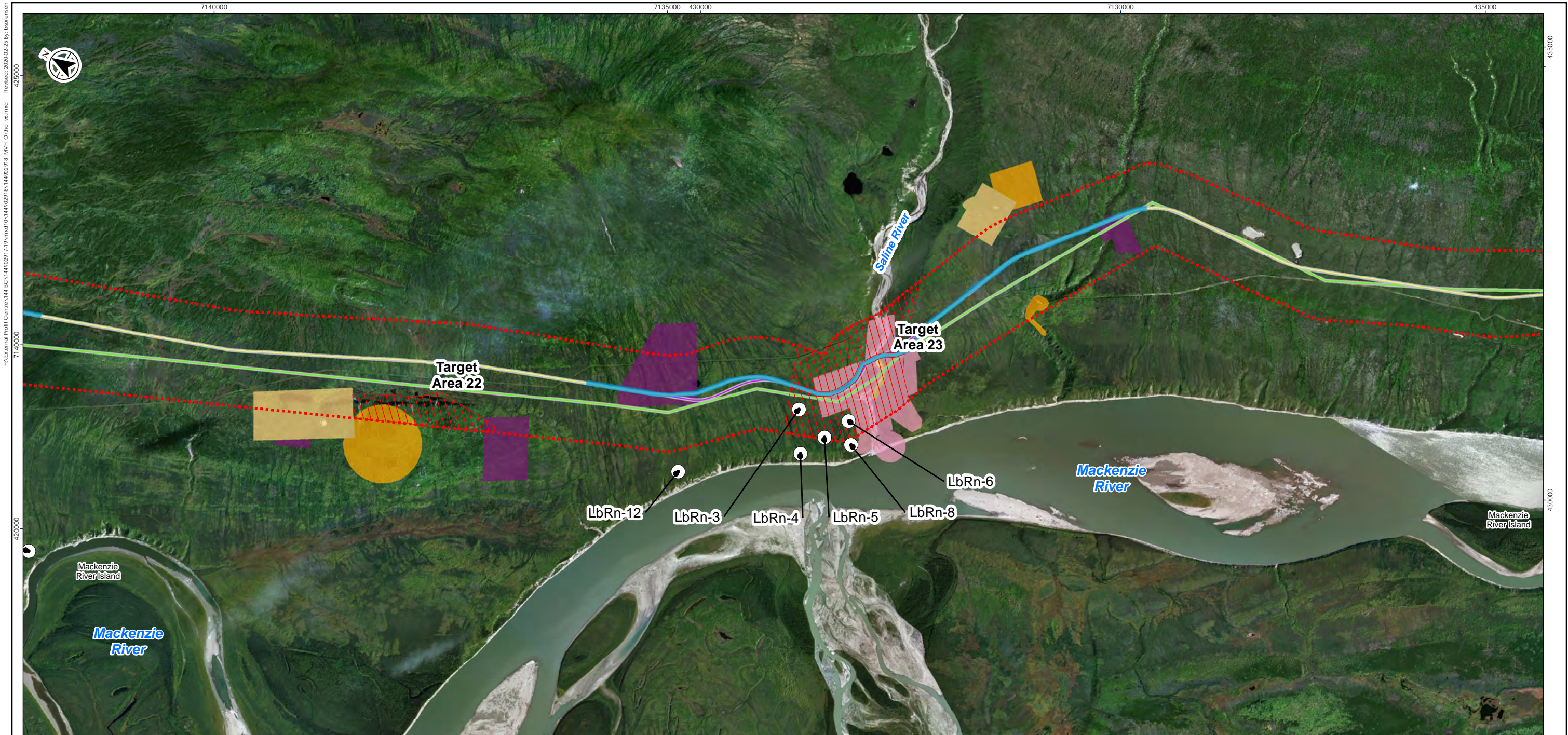
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Project Location
Central NWT
Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. 8
Title

Orthographic Map of Mackenzie Valley Highway AOA Evaluation Footprint and Target Areas

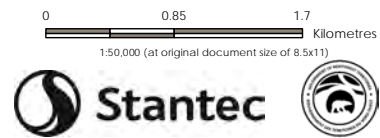


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,
NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China
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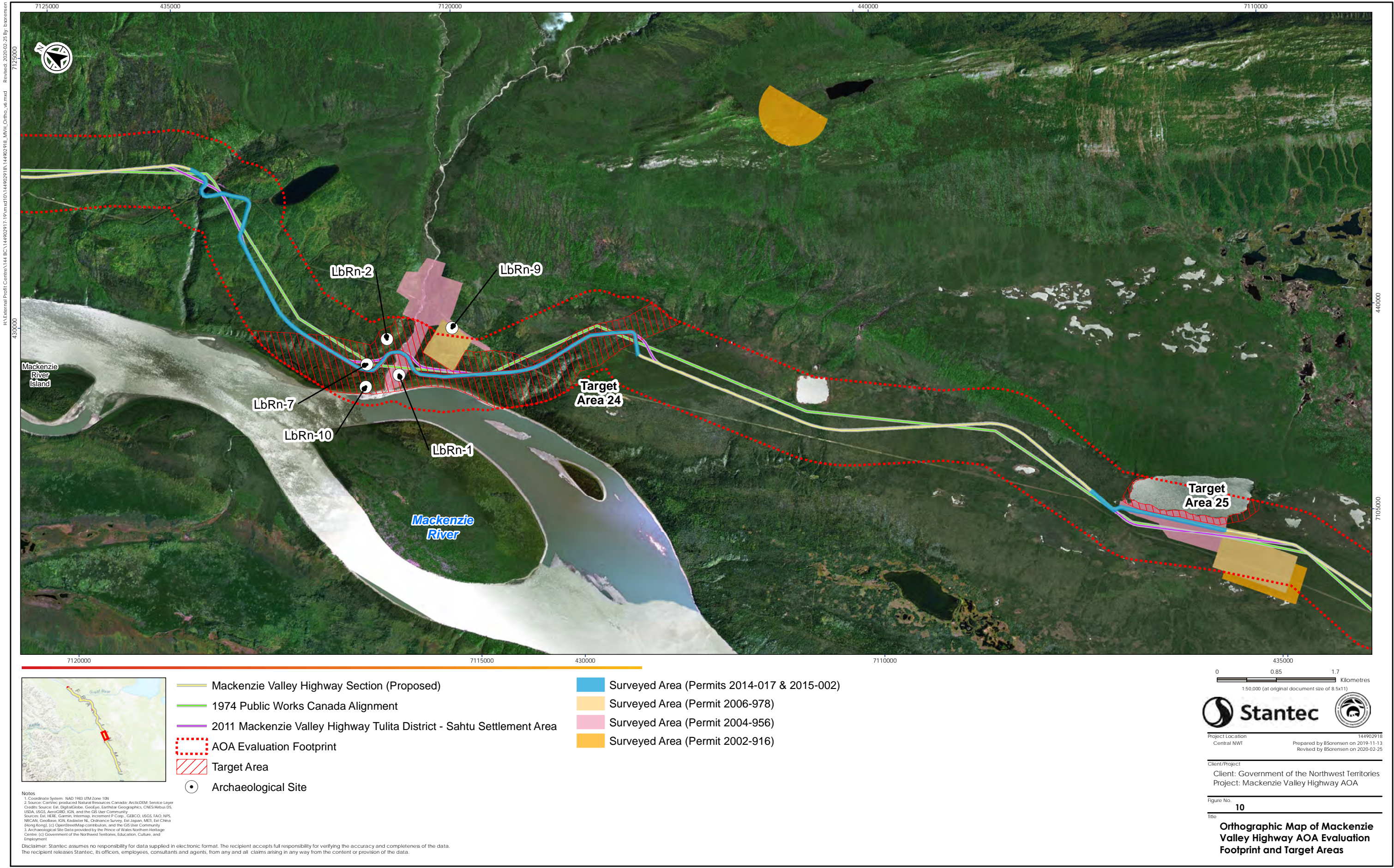


Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
9
Title

**Orthographic Map of Mackenzie
Valley Highway AOA Evaluation
Footprint and Target Areas**



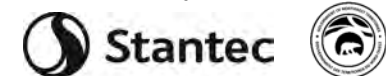
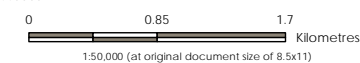


-  Surveyed Area (Permits 2014-017 & 2015-002)
 Surveyed Area (Permit 2006-978)
 Surveyed Area (Permit 2004-956)
 Surveyed Area (Permit 2003-933)
 Surveyed Area (Permit 2002-916)

Notes

1. Coordinate System: NAD 1983 UTM Zone 10N
2. Source: CanVec produced by Natural Resources Canada; ArcticDEM: Service Layer Credits: Source: DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
3. Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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Project Location	144902918
Central NWT	Prepared by BSorensen on 2019-11-13
	Revised by BSorensen on 2020-02-25

Client/Project

Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. **11**

Orthographic Map of Mackenzie Valley Highway AOA Evaluation Footprint and Target Areas

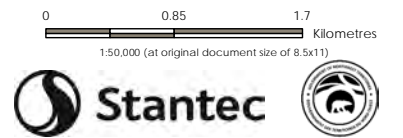


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2012 Proposed Mackenzie Valley Highway Extension – Dehcho Region
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,
NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China
(Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
12
Title

Orthographic Map of Mackenzie
Valley Highway AOA Evaluation
Footprint and Target Areas

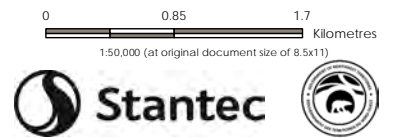


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2012 Proposed Mackenzie Valley Highway Extension – Dehcho Region
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,
NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China
(Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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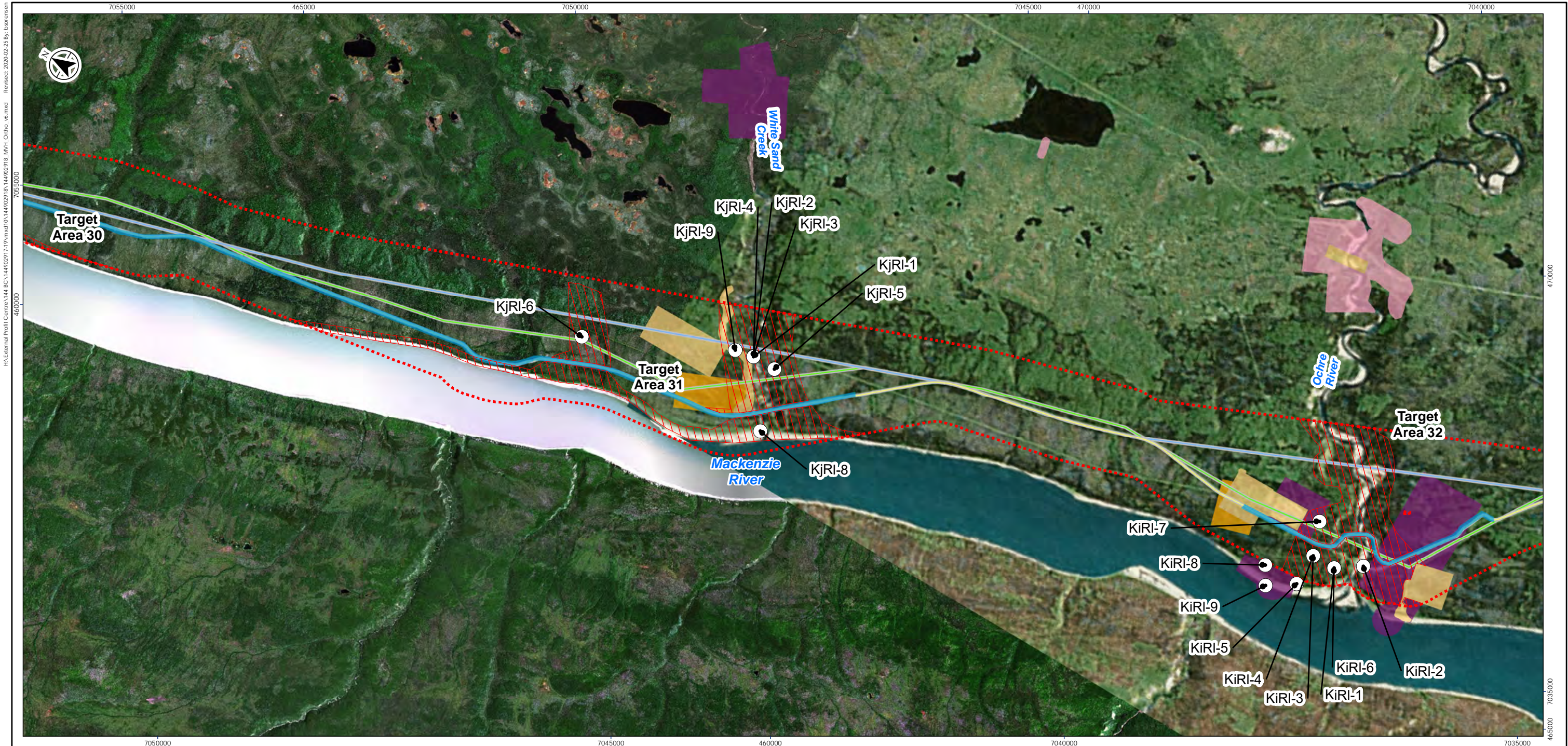
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Project Location
Central NWT
Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
13
Title

Orthographic Map of Mackenzie
Valley Highway AOA Evaluation
Footprint and Target Areas



- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2012 Proposed Mackenzie Valley Highway Extension – Dehcho Region
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes

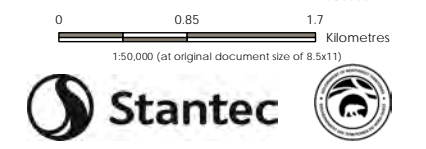
1. Coordinate System: NAD 1983 UTM Zone 18N

2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

3. Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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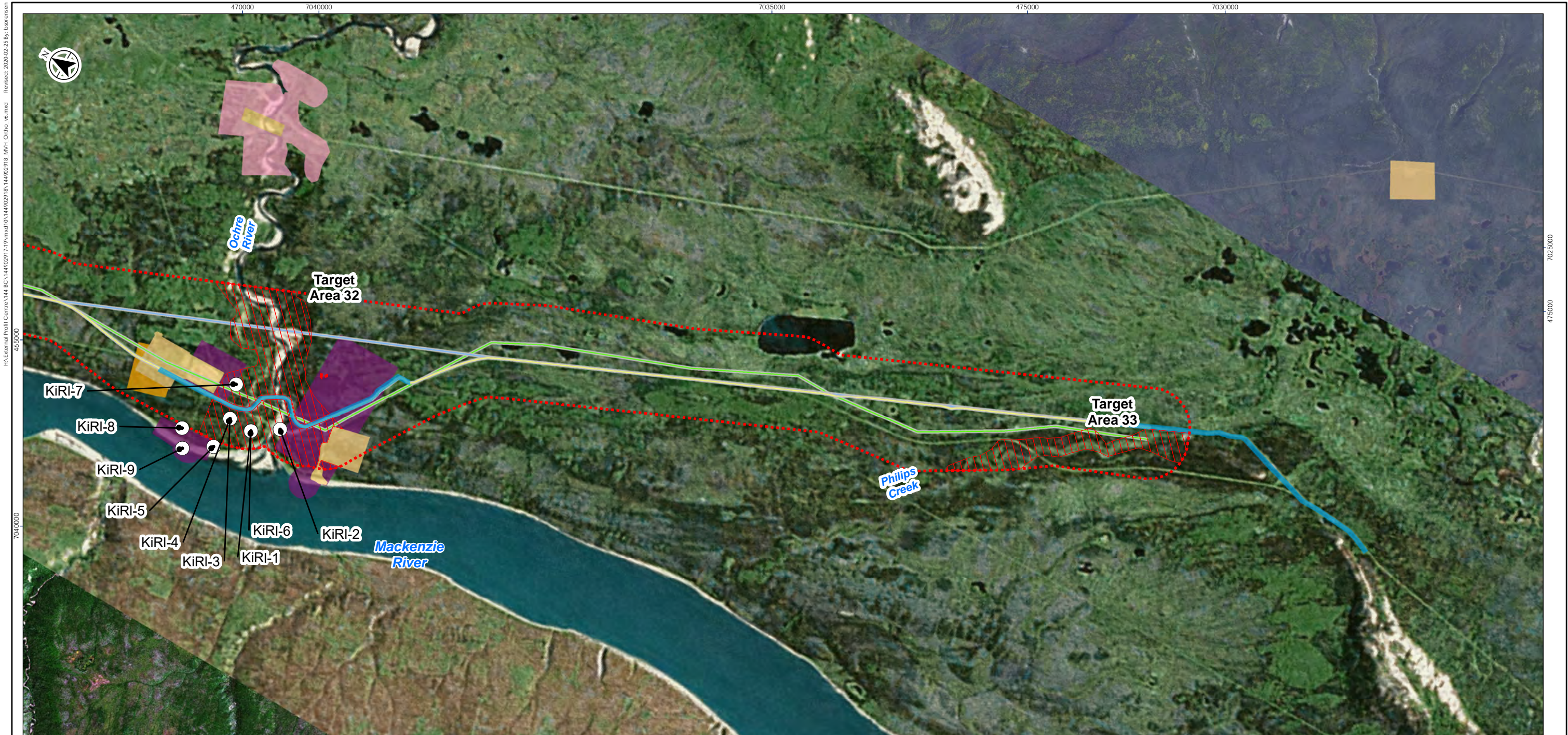


Project Location
Central NWT

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. 14

Orthographic Map of Mackenzie Valley Highway AOA Evaluation Footprint and Target Areas

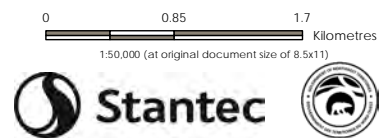


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2012 Proposed Mackenzie Valley Highway Extension – Dehcho Region
- AOA Evaluation Footprint
- Target Area
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS,
NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China
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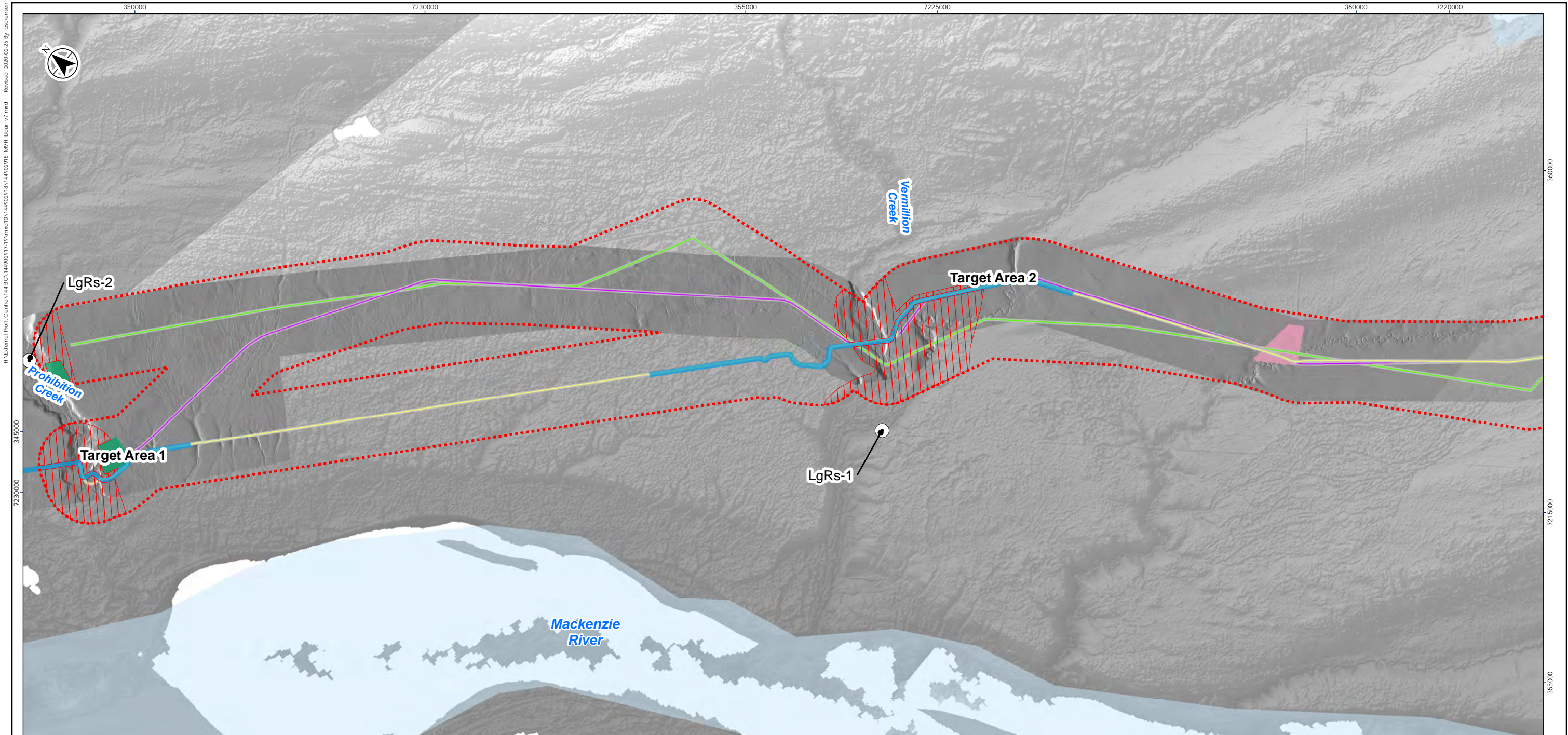


Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
15
Title

Orthographic Map of Mackenzie
Valley Highway AOA Evaluation
Footprint and Target Areas

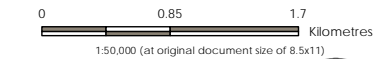


Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Waterbody
- Archaeological Site

- Surveyed Area (Permit 2016-004)
- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2004-956)

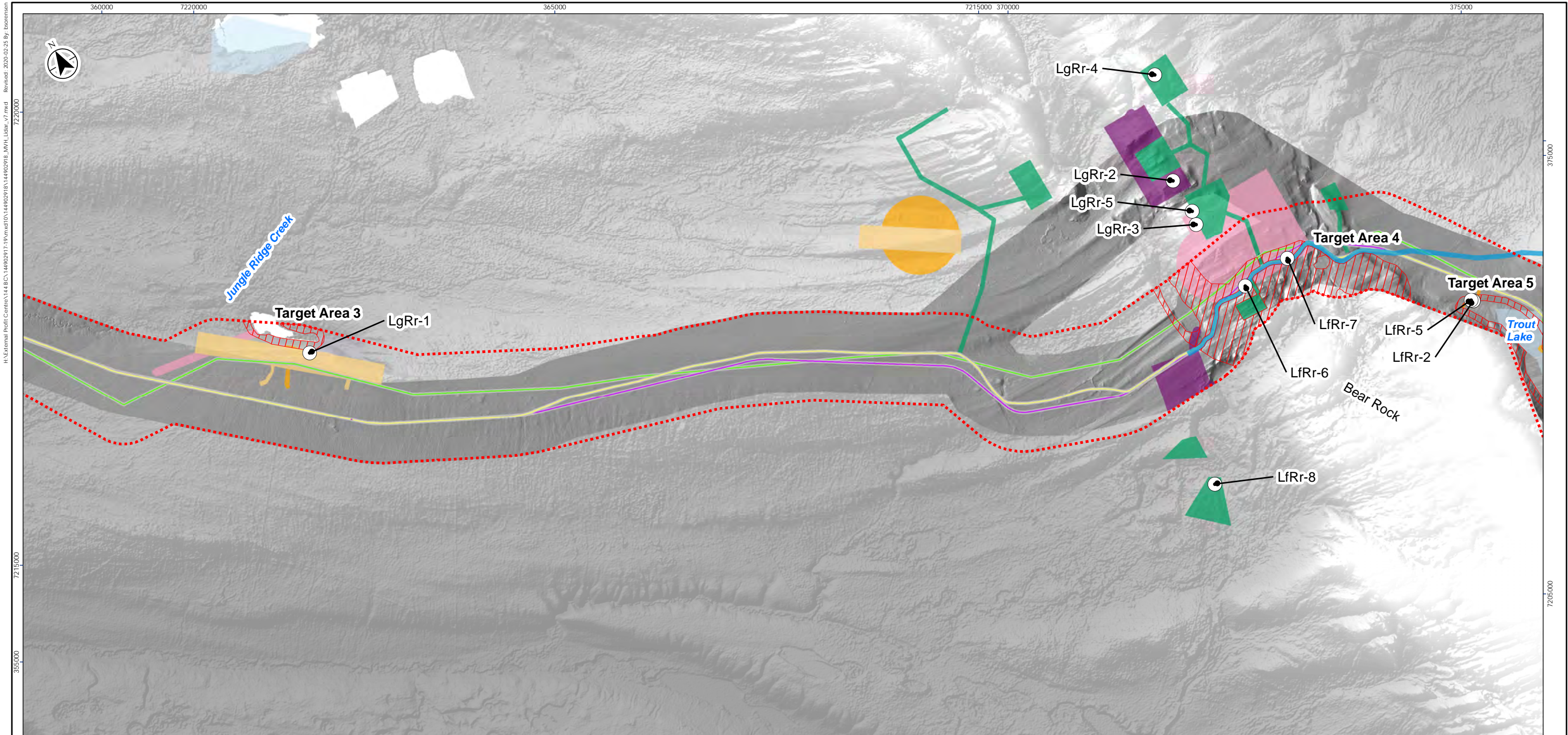


Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
16

Title
**LiDAR and ArcticDEM Map of
Mackenzie Valley Highway AOA
Evaluation Footprint and Target Areas**

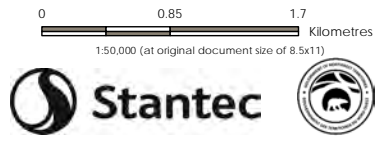


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Waterbody
- Archaeological Site

- Surveyed Area (Permit 2016-004)
- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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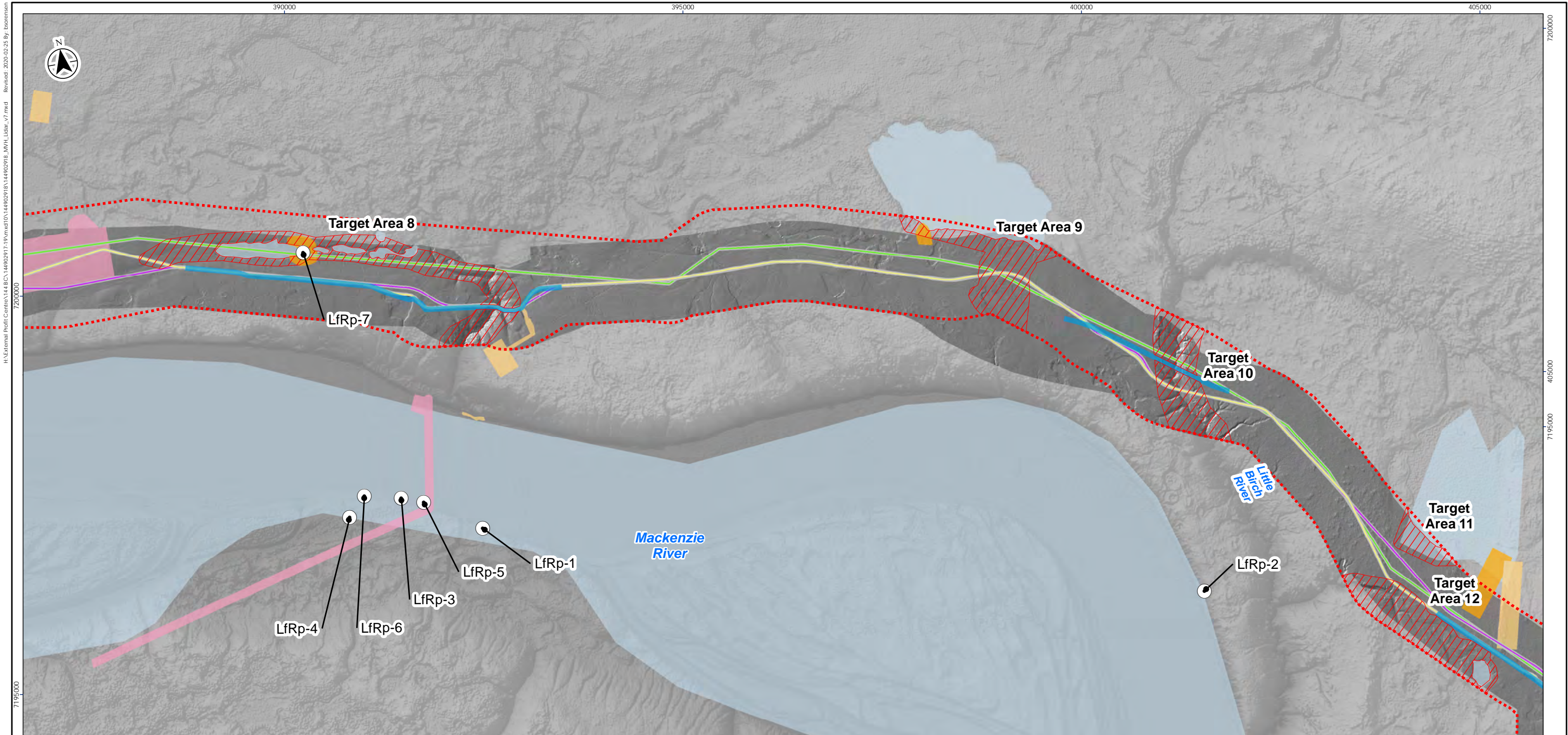


Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. 17

LiDAR and ArcticDEM Map of
Mackenzie Valley Highway AOA
Evaluation Footprint and Target Areas

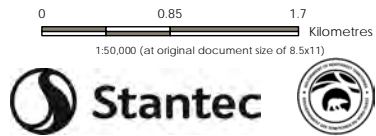


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Waterbody
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
3. Archaeological Site Data provided by the Prince of Wales Northern Heritage Centre (c) Government of the Northwest Territories, Education, Culture, and Employment

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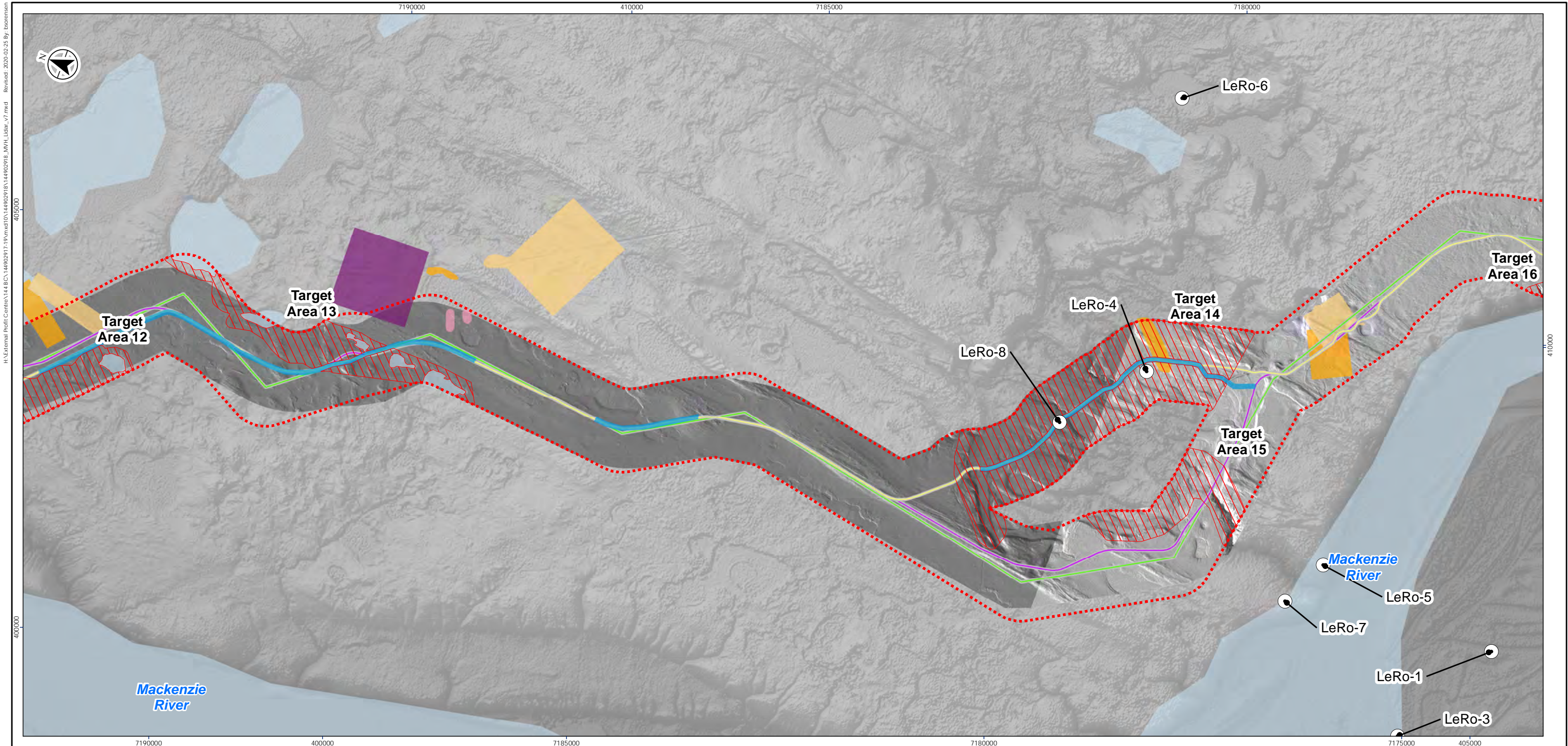
Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. 19
Title

**LiDAR and ArcticDEM Map of
Mackenzie Valley Highway AOA
Evaluation Footprint and Target Areas**

H:\External Profile Centre\1144802918\144902918\144902918_ArcticDEM_Lidar_v7.mxd
Revised: 2020-02-25 By: Borensen

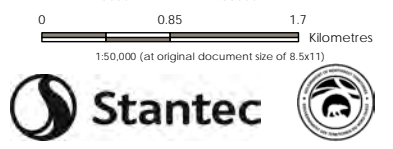


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Waterbody
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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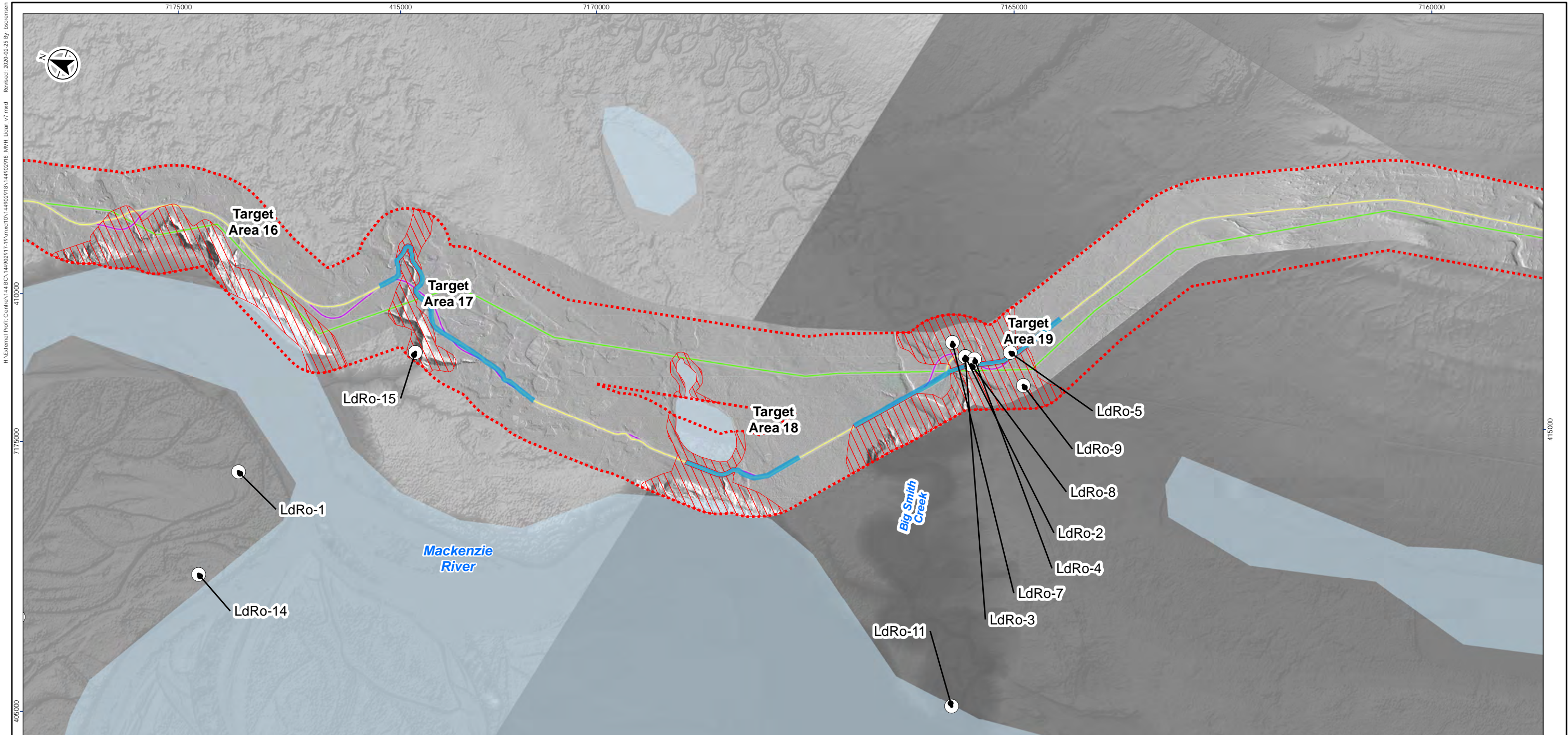


Project Location: Central NWT
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. 20

Title
LiDAR and ArcticDEM Map of Mackenzie Valley Highway AOA Evaluation Footprint and Target Areas

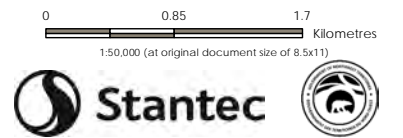


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Waterbody
- Archaeological Site

Surveyed Area (Permits 2014-017 & 2015-002)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer
Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS,
FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI,
Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User
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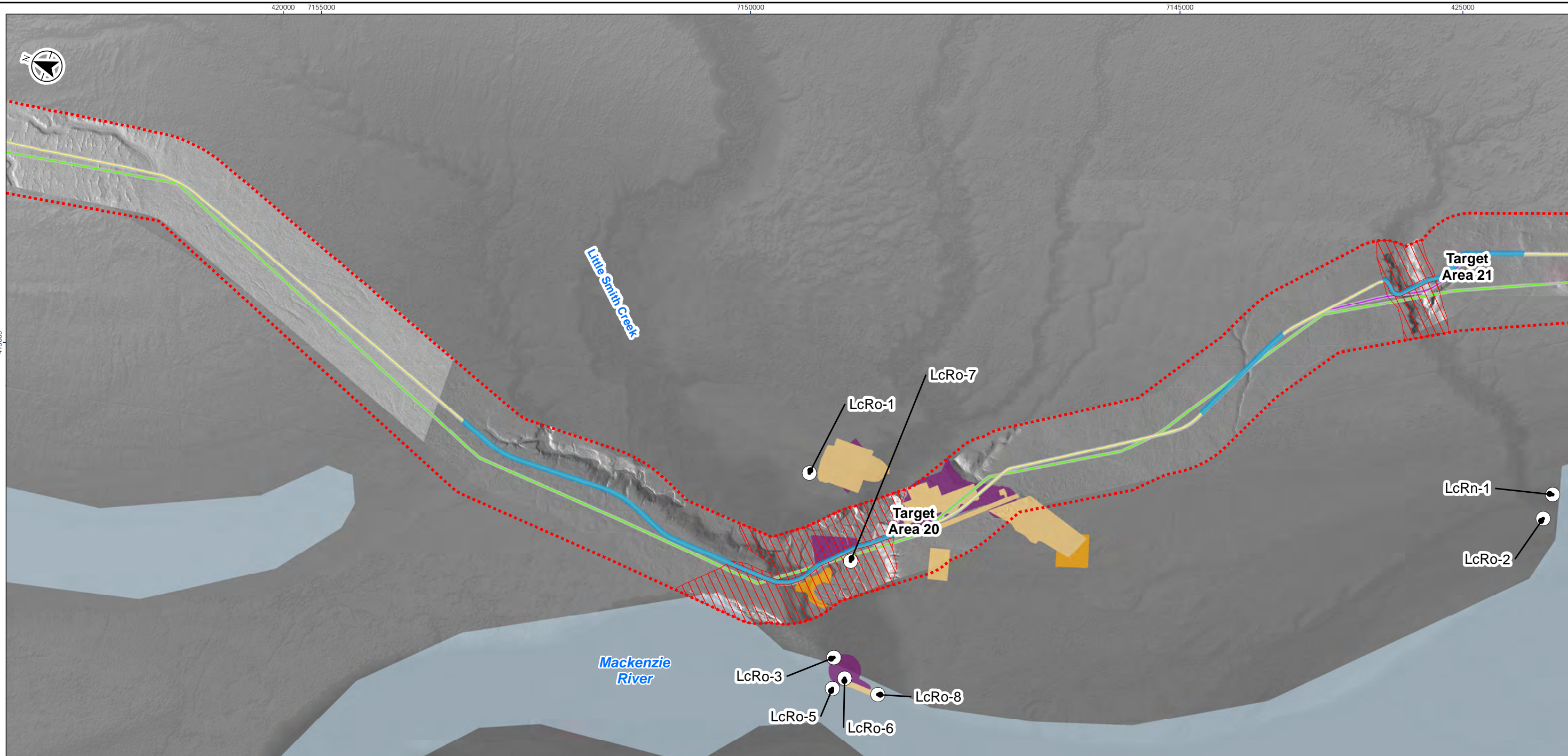
Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
21

Title
**LiDAR and ArcticDEM Map of
Mackenzie Valley Highway AOA
Evaluation Footprint and Target Areas**

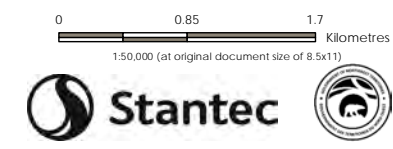
H:\External\Profit Centre\144802917\19\mxd\10\144902918\144902918_ArcticDEM_Lidar_v7.mxd
Revised: 2020-02-25 By: borenson



- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Waterbody
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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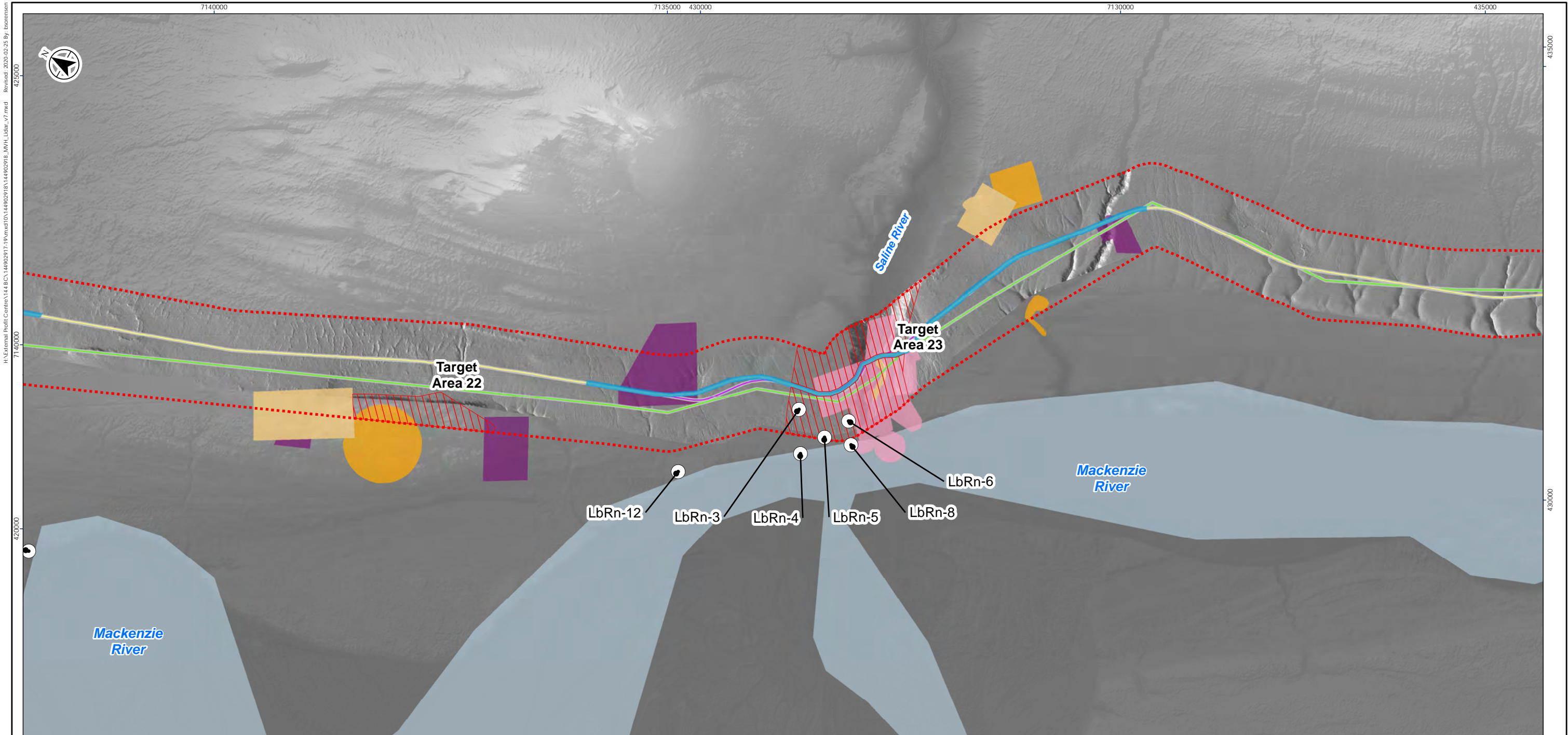


Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

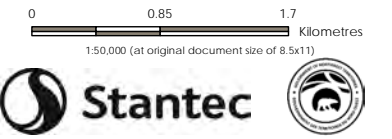
Figure No. 22

Title
LiDAR and ArcticDEM Map of
Mackenzie Valley Highway AOA
Evaluation Footprint and Target Areas



Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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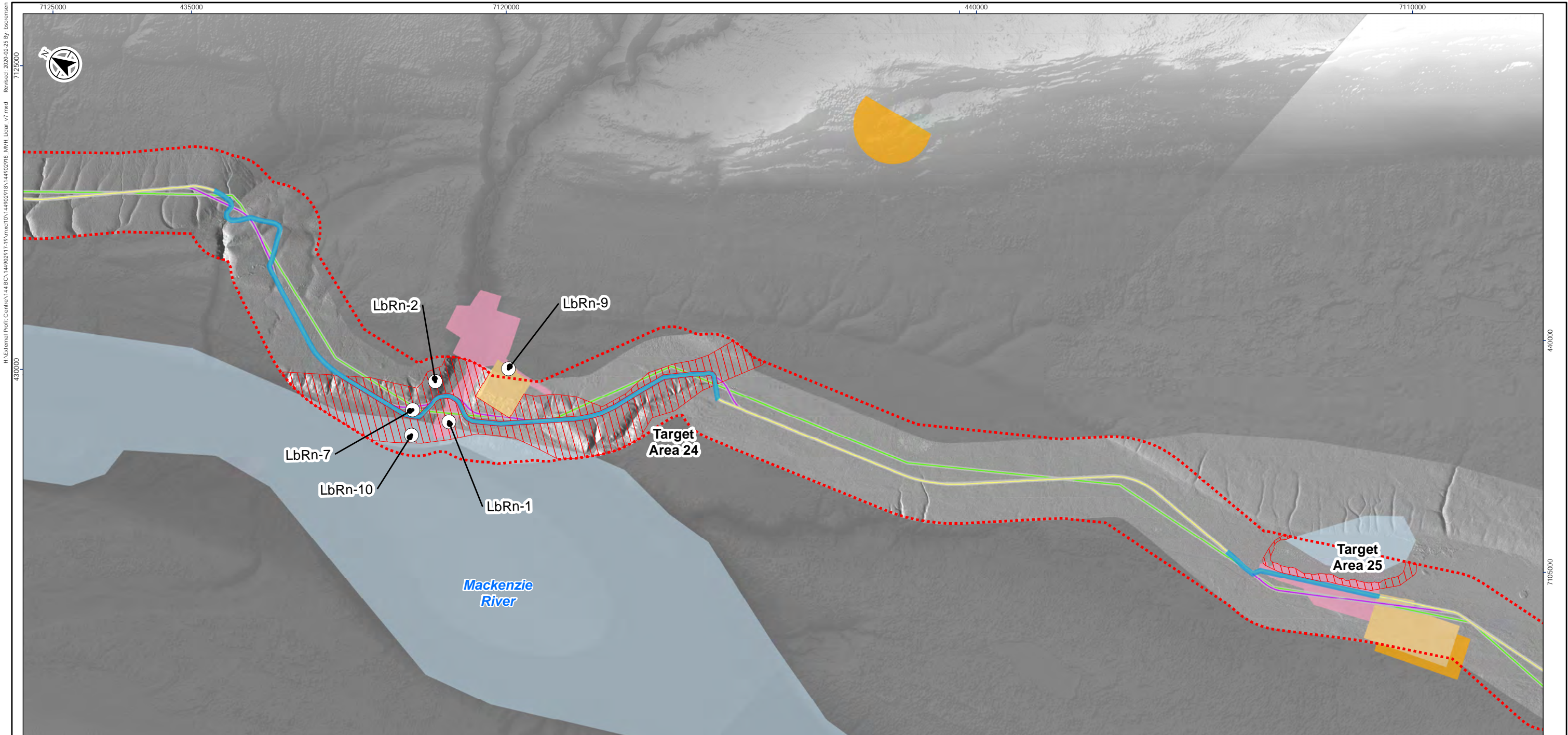


Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. 23

Title
LiDAR and ArcticDEM Map of
Mackenzie Valley Highway AOA
Evaluation Footprint and Target Areas

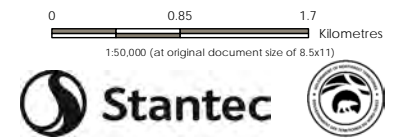


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Waterbody
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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Project Location: Central NWT
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. **24**
Title
LiDAR and ArcticDEM Map of Mackenzie Valley Highway AOA Evaluation Footprint and Target Areas

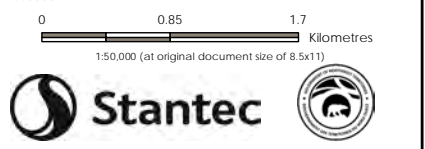
H:\External Profile Centre\1144BC\144902918\144902918_ArcticDEM_Lidar_v7.mxd
Revised: 2020-02-25 By: Borensen



- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2012 Proposed Mackenzie Valley Highway Extension – Dehcho Region
- 2011 Mackenzie Valley Highway Tulita District - Sahtu Settlement Area
- AOA Evaluation Footprint
- Target Area
- Waterbody
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer
Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, ETO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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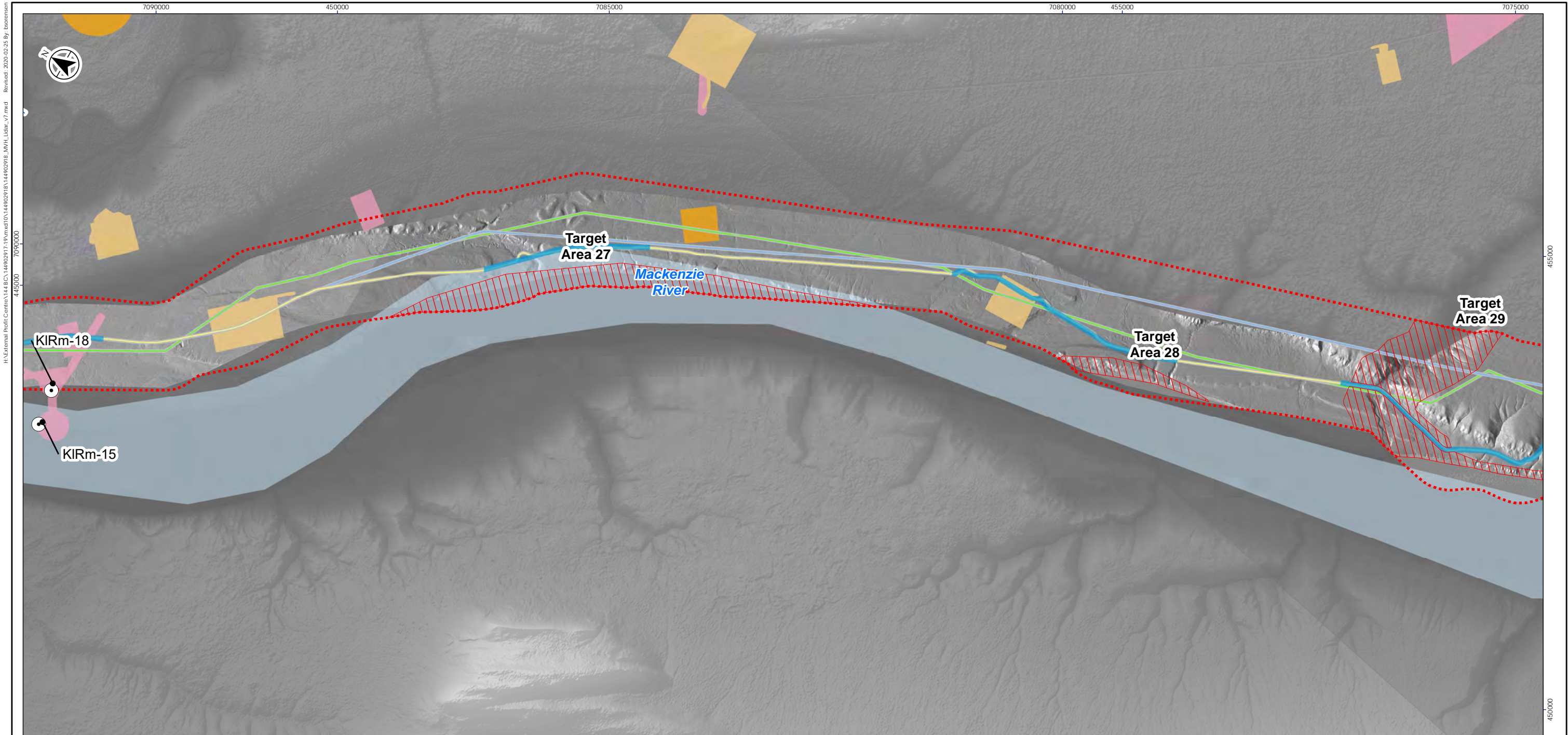


Project Location
Central NWT
144902918
Prepared by B.Sorensen on 2019-11-13
Revised by B.Sorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. 25
Title

**LiDAR and ArcticDEM Map of
Mackenzie Valley Highway AOA
Evaluation Footprint and Target Areas**

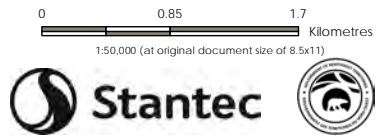


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2012 Proposed Mackenzie Valley Highway Extension – Dehcho Region
- AOA Evaluation Footprint
- Target Area
- Waterbody
- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
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- Surveyed Area (Permit 2002-916)

Notes
1. Coordinate System: NAD 1983 UTM Zone 18N
2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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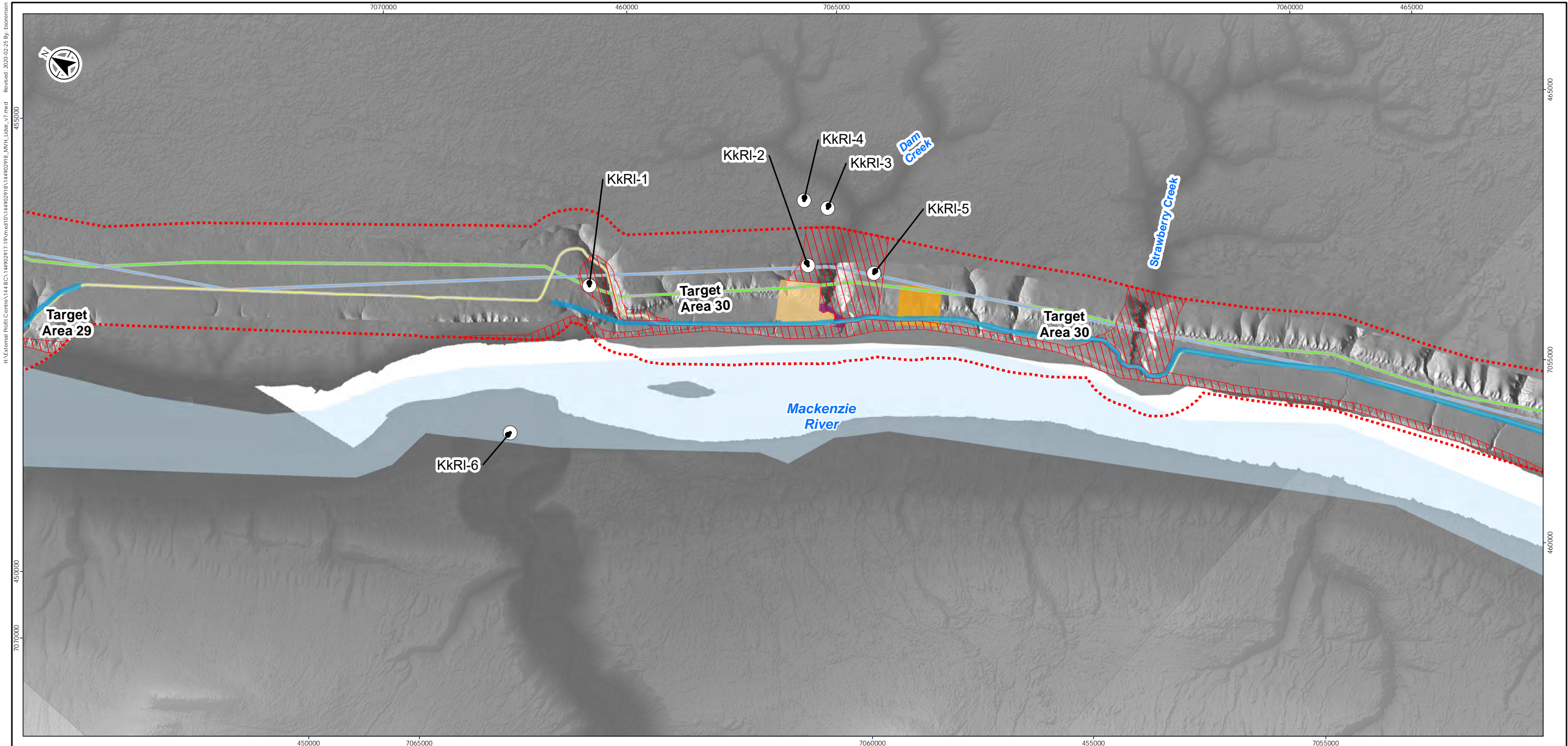
Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. 26
Title

**LiDAR and ArcticDEM Map of
Mackenzie Valley Highway AOA
Evaluation Footprint and Target Areas**

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Revised: 2020-02-25 By: Borensen

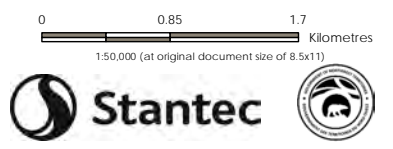


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2012 Proposed Mackenzie Valley Highway Extension – Dehcho Region
- AOA Evaluation Footprint
- Target Area
- Waterbody
- Archaeological Site

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- Surveyed Area (Permit 2002-916)

Notes
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2. Source: CanVec produced Natural Resources Canada: ArcticDEM: Service Layer
Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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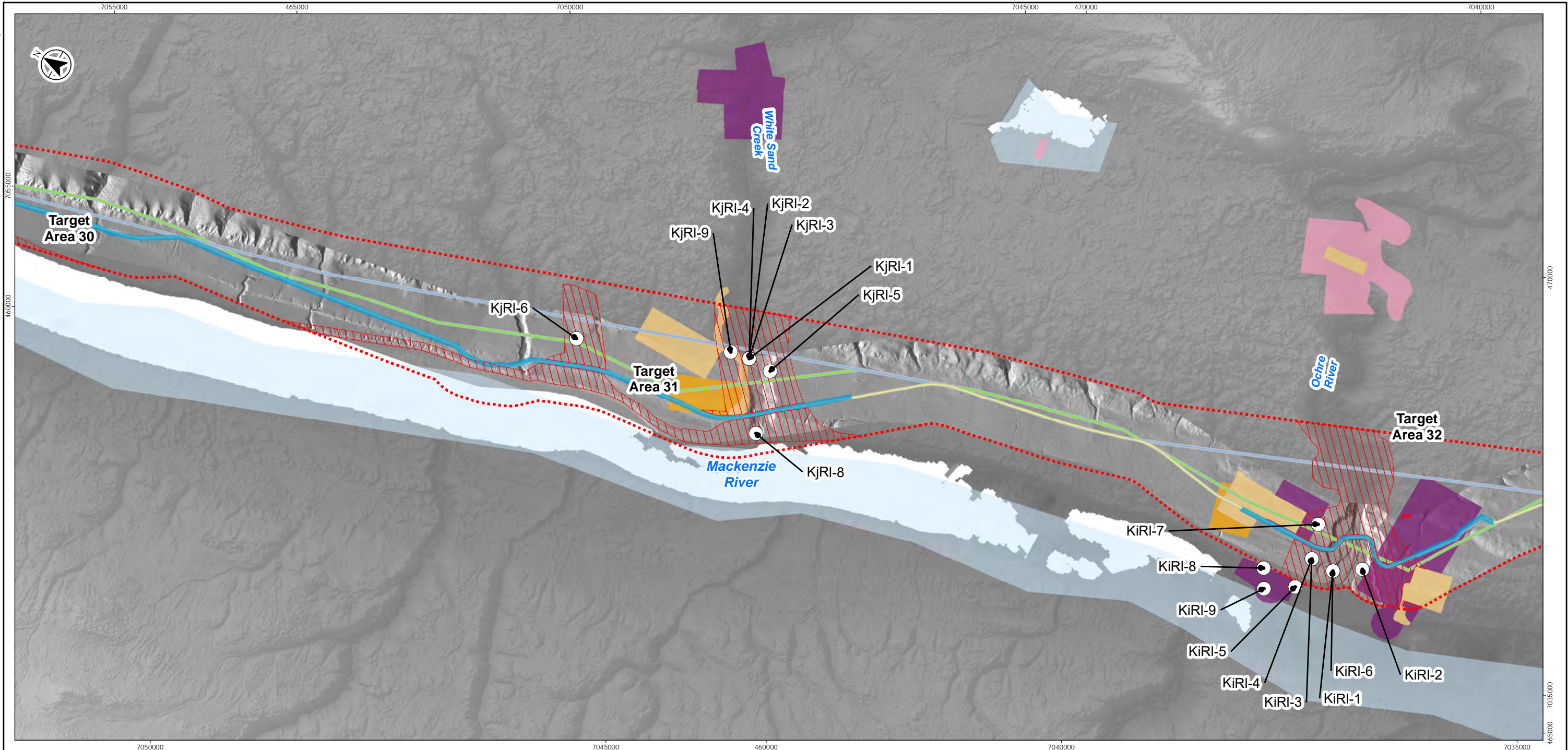
Project Location
Central NWT
144902918
Prepared by Borensen on 2019-11-13
Revised by Borensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
27

Title
**LiDAR and ArcticDEM Map of
Mackenzie Valley Highway AOA
Evaluation Footprint and Target Areas**

H:\External\Profile Centre\144BC\144902918\144902918_AW1_Lidar_v7.mxd
Revised: 2020-02-25 By: borenson

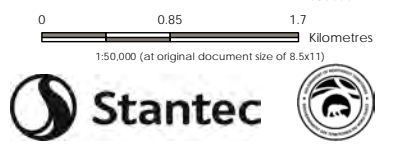


- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2012 Proposed Mackenzie Valley Highway Extension – Dehcho Region
- AOA Evaluation Footprint
- Target Area
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- Archaeological Site

- Surveyed Area (Permits 2014-017 & 2015-002)
- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
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- Surveyed Area (Permit 2002-916)

Notes
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2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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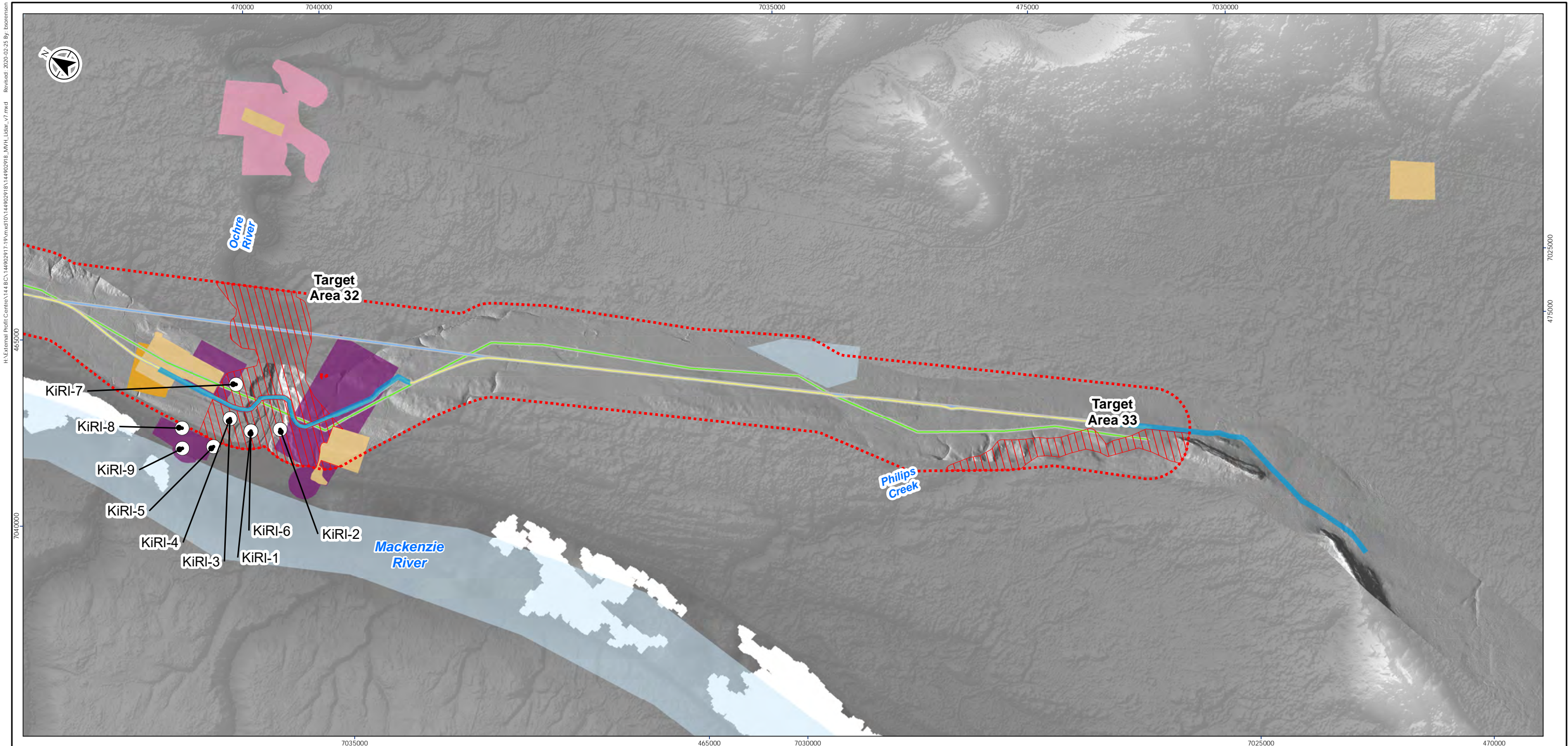
Project Location: Central NWT
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No. 28

Title
LiDAR and ArcticDEM Map of Mackenzie Valley Highway AOA Evaluation Footprint and Target Areas

H:\External\Profit Centre\144BC\144902917\19\mxd\10\144902918\144902918_AWIL_Lidar_v7.mxd
Revised: 2020-02-25 By: B.Sorensen



- Mackenzie Valley Highway Section (Proposed)
- 1974 Public Works Canada Alignment
- 2012 Proposed Mackenzie Valley Highway Extension – Dehcho Region
- AOA Evaluation Footprint
- Target Area
- Waterbody
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- Surveyed Area (Permit 2006-978)
- Surveyed Area (Permit 2004-956)
- Surveyed Area (Permit 2003-933)
- Surveyed Area (Permit 2002-916)



Notes
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2. Source: CanVec produced Natural Resources Canada: ArcticDEM; Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBasis, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
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Project Location
Central NWT
144902918
Prepared by BSorensen on 2019-11-13
Revised by BSorensen on 2020-02-25

Client/Project
Client: Government of the Northwest Territories
Project: Mackenzie Valley Highway AOA

Figure No.
29

Title
**LiDAR and ArcticDEM Map of
Mackenzie Valley Highway AOA
Evaluation Footprint and Target Areas**