APPENDIX D
SPILL CONTINGENCY PLAN

Aklavik Airport Drainage Improvements
Spill Contingency Plan
Revision 02

Government of the Northwest Territories

NOVEMBER 2019
ISSUED FOR USE | REVISION 02
FILE: 704-ENW.EENW03288-01

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Distribution List

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Bijaya Adhikari, Inuvialuit Water Board – Science and Regulatory Coordinator
Moshiur Rahman, Government of the Northwest Territories – Airport Planning Officer
Geoff Petzold, CIMA Canada Inc. – Project Manager

1.0 INTRODUCTION

This Spill Contingency Plan (SCP) outlines the plan for managing spill response at the Aklavik Airport Drainage Improvements Project. The SCP is a living document which will be updated based on regular yearly reviews including management reviews, incident investigations, regulatory, or Project-specific protocol changes. This SCP was originally included as Appendix D in the Project Description Report for the Aklavik Airport Drainage Improvements Project (the Project).

The purpose of the SCP is to provide a guide to all site personnel in the event of an accidental release of fuel or other hazardous material during the Project. The SCP provides the protocols for personnel to follow in response to a spill. All persons involved with the Project should read and be familiar with the SCP. To be effective, it is important that all personnel are familiar with their responsibilities and steps to take in the event of a spill.

The objectives of the SCP are to minimize potential effects from Project fuel spills on the environment, the health and safety of employees, and the community, and to comply with all applicable legislation, regulations, authorizations, permits and licences for the duration of the Project.

The SCP will be posted at the Project site and will be provided to all employees and contractors.

2.0 COMPANY NAME, CONTACT, AND EFFECTIVE DATE

The Government of the Northwest Territories (GNWT) is the proponent for the proposed Project. Key contact information for this Project is as follows:

Moshiur Rahman, Airport Planner
Government of the Northwest Territories
Department of Infrastructure
5015 – 49 Street Yellowknife, NT, X1A 2L9
Phone: (867) 767-9084 ext. 31079
Fax: (867) 873-0297
Email: Moshiur_Rahman@gov.nt.ca

The information presented herein (the effective date) is current as of October, 2019. Contact the GNWT to obtain additional copies of the plan.

The information on Environmental Policies of the GNWT related to regulatory compliance, environmental protection, safety, spill response, and clean-up can be accessed online at https://www.gov.nt.ca/.

3.0 PROJECT DESCRIPTION

The purpose of the Project is to improve the drainage at the Aklavik Airport, specifically two problem areas at the airport (Area 1 and Area 2). The Aklavik Airport is located at 68º13’23.57” N, 135º00’23.03” W, within the Hamlet of Aklavik (Hamlet). Site drawings are included in Appendix D-1.

Significant portions of the Hamlet and airport flood in the spring during “break-up”. After flood waters recede, Areas 1 and 2 do not drain completely, which has reportedly been a problem for the Hamlet and airport. The purpose of this Project is to develop a practical plan for draining Areas 1 and 2 by gravity after flood waters subside.

The Project would have Area 1 graded with a perimeter swale constructed around it. The perimeter swale would drain to an existing ditch that runs along the airport runway. The ditch would be reworked to daylight into the Peel Channel, south of the airport. Area 2 would have a swale constructed through the centre of it. The swale would lead to a short ditch that would daylight into the Peel Chanel, north of the airport.

The construction of the swales and ditches would be as follows:

- Typically, a 2 metre (m) wide base constructed with 200 millimetre (mm) granular ditch bedding over geotextile.
- The swales would have back slopes to match the existing ground elevations to a maximum slope of 3:1.
- The ditches would typically have back slopes at 3:1.
- The ditch for Area 1 would daylight into the Peel Channel at 68º13’07.35” N, 134º59’57.21” W, and ditch for Area 2 would daylight into the Peel Channel at 68º13’45.23” N, 135º00’46.44” W.
- The length of the ditch from Area 1 to the Peel Channel would be approximately 855 m long.
- The length of the short ditch for Area 2 would be approximately 55 m long.

It is anticipated that the heavy equipment used for this Project will include a backhoe.

4.0 POTENTIAL CONTAMINANTS (HAZARDOUS MATERIALS)

During construction of this type, typically fuel storage is limited to the capacity available within the construction vehicle / equipment. The main potential contaminants (hazardous materials) associated with the Project are listed below.

- Gasoline and/or diesel fuel to be used in the construction equipment (excavator, loader, crane, backhoe, water truck or other vehicles);
- During construction of this type, typically fuel storage is limited to the capacity available within the construction vehicle / equipment. The typical capacity for an excavator is up to 300 L, and a typical truck holds 300 L; and
- Antifreeze in vehicles (typical vehicles hold 5 L to 10 L). Number of vehicles on site will vary during construction, assumed to typically be around five vehicles on site at any one time.

The above list includes typical hazardous materials for construction work of this kind, however, the estimated material type, storage capacity, number of vehicles and containment type are subject to change during construction. Potential spill sizes and impacts are noted in Section 5.0. Re-fueling procedures are noted in Section 6.0. Material Safety Data Sheets (MSDS) for each of these products are provided in Appendix D-2.

Although the fuel systems are designed to prevent incidents and have further protective measures built in to prevent release of these products, a spill or leak incident may occur. The primary objective is to contain spilled fuel and prevent or minimize further environmental impacts. Spills may result from any of the following situations:

- Spills from construction equipment;
- Accidents during fuel transportation;
- Spills during fuel transfer or overfilling tanks;
- Leaks or ruptures in tanks, or;

- Equipment failure including valves, piping or containment structures.

The following potential environmental impacts may result from spills.

- Diesel and gasoline fuel may be harmful to wildlife and aquatic life. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Diesel burns slowly and thus risk to the environment is reduced during recovery as a burn can be more readily contained compared with volatile fuels. Runoff into waterbodies must be avoided.
- Antifreeze may be harmful to aquatic life if spilled or leaked into a waterbody. While in an engine, antifreeze may become contaminated with fuel. It is not readily biodegradable and has the potential for bioaccumulation in the environment. Runoff into waterbodies must be avoided.

Regular inspection and maintenance of the construction equipment, in accordance with recognized and accepted Standard Operating Procedures (SOPs), will be implemented and will reduce the possibility and frequency of potential spills. Spill response training will also be provided to personnel who handle fuels, other petroleum products and antifreeze. In case of a spill, a suitably equipped Spill Kit will be positioned at the Project.

5.0 POTENTIAL SPILL SIZES AND IMPACTS

Given the nature of the Project, it is most unlikely that a major spill could occur on site. All equipment fuel will be stored in the equipment's fuel tanks. More likely, if one or more spill incidents were to occur, they would more likely be of a small, chronic leak nature (<1 L). Section 6.0 of this SCP outlines the steps being taken to minimize spill risks. The potential impacts of a spill are dependent on the location of the spill, and whether or not the contaminant enters a body of water. Spills that enter a body of water typically have a greater potential for risk of impact, however, full impacts of a hazardous material spill cannot be determined as scenarios can vary greatly depending on the material and nature of the existing site parameters (wildlife, fish, soil profile, gradient, etc.).

6.0 SPILL PREVENTATIVE MEASURES

The following steps will be taken to mitigate any potential spills on site:

- Any fuel storage containers (or vehicles holding fuel) to be parked at least 50 m away from any stream or waterbody when not in use. No re-fueling will be undertaken within 50 m of a waterbody. Given that the Project will take place in the Hamlet, re-fueling is more likely to occur at the Contractor's own property, off-site.
- All employees handling materials or containment on site must be trained and familiar with best local practices for spill prevention.
- Careful handling of any containers or fuel transfers.
- Daily vehicle maintenance checks, daily equipment checks, and repair of any leakages immediately.
- Caution while operating vehicles, and an overall positive attitude towards spill prevention and safety of the sensitive equipment on the site.
- Management on site to encourage best practices and caution when handling or operating equipment.
- Equipment operators to make eye contact with anyone working on the ground and ensure that proper site access is established and maintained during construction to mitigate the risk of any accidents.
- Any hazardous materials will be stored and transported in approved sealed containers.
- Fuel spill kit will to be kept well stocked and located in proximity to the planned activities.

7.0 TRAINING

A copy of the SCP will be available at each of the construction sites during the construction period. Employees will be required to be familiar with the contents of the SCP, the spill response resources at hand, and appropriate spill response methods. Training/orientation will be completed as appropriate for all employees on site.

Employees will be required to review the list of available spill response resources, such as number of items, their location, condition, date of last inspection and any special comments.

8.0 POTENTIALLY IMPACTED COMMUNITIES

Potentially impacted parties could include the Hamlet of the Aklavik.

9.0 TRADITIONAL AND OTHER LAND USES

The Project is being completed at the Aklavik Airport, which is well within the municipal boundaries of the Hamlet Aklavik. Impacts to traditional land uses and other land uses are not anticipated from this Project.

10.0 RESPONSE ORGANIZATION

All spills are to be initially reported to the GNWT. Moshiur Rahman will be the main contact for any media or public enquiries. In this section, there are items listed as to be determined (TBD). These are dependent of the selected contractor, and they can be updated at a later date once the contractor has been selected.

If a spill on site meets or exceeds the minimum reportable thresholds (Table 10-1), the spill will be reported to the NWT-NU 24-Hour Spill Report Line. All spills of fuel or hazardous materials into a water body or onto ice will be immediately reported to the 24-Hour Spill Report Line.

If the public may be impacted by the spill, the spill should be reported to the GNWT and the NWT-NU 24-Hour Spill Report Line. If there is an immediate threat to the public due to the spill, also contact the local RCMP and Fire Department (listed below in Table 10-2).

GNWT Contact:

Phone: (867) 767-9084 ext. 31079
Fax: (867) 873-0297
Email: Moshiur_Rahman@gov.nt.ca

24-Hour Spill Report Line:

Phone: **867.920.8130**
Fax: 867.873.6924
Email: spills@gov.nt.ca

The NT-NU Spill Form (provided in Appendix D-3) will be completed for each reportable spill and transmitted by email as required.

The report will be completed in accordance with the Consolidation of Spill Contingency Planning and Reporting Regulations, and contain the following information:

- Date and time of spill;
- Type of contaminant spilled and quantity;
- Location of spill;
- Direction spill is moving;
- Name and phone number of a contact person close to the location of the spill;
- Cause of spill;
- Whether spill is continuing or has stopped;
- Description of existing contaminant;
- Action taken to contain, recover, clean up, and dispose of spilled contaminant;
- Name, address and phone number of person reporting the spill; and
- Name of person in charge of the management and control of contaminants at the time of the spill.

Table 10-1: External Reporting Volumes (INAC 2007)

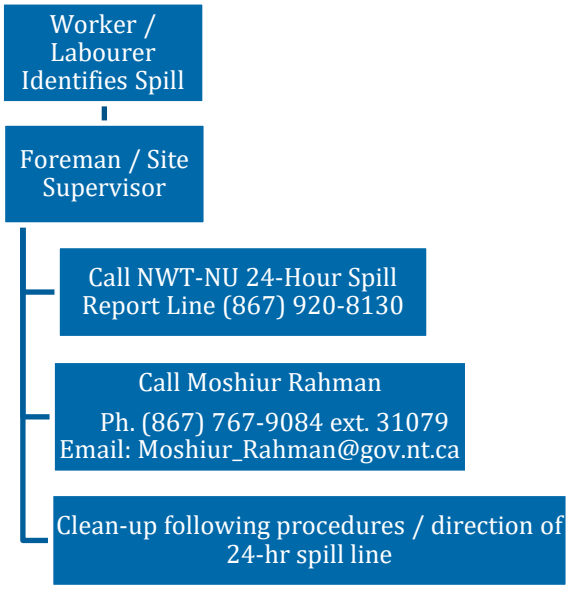
TDGA Class	Description of Contaminant	Amount Spilled
2.1	Compressed gas (flammable)	Any amount from containers with a capacity greater than 100 L
2.2	Compressed gas (non-corrosive, non-flammable)	Any amount from containers with a capacity greater than 100 L
2.3	Compressed gas (toxic)	Any amount
2.4	Compressed gas (corrosive)	Any amount
3.1, 3.2, 3.3	Flammable liquid	100 L
4.1	Flammable solid	25 kilogram (kg)
4.2	Spontaneously combustible solids	25 kg
4.3	Water reactant solids	25 kg
5.1	Oxidizing substances	50 L or 50 kg
5.2	Organic Peroxides	1 L or 1 kg
7	Radioactive	Any amount
8	Corrosive substances	5 L or 5 kg
9.1 (in part)	Miscellaneous products or substances,	50 L or 50 kg
9.1 (in part)	PCB mixtures of five or more ppm	0.5 L or 0.5 kg
None	Other contaminants	100 L or 100 kg

Table 10-2 outlines other resources that can be contacted if outside assistance is required. Contact information related to selected contractor can be updated once the contractor has been selected.

Table 10-2: Contact Information

Company	Name	Number
NWT-NU 24-Hour Spill Report Line		(867) 920-8130
GNWT Contact	Moshiur Rahman	(867) 767-9084 ext. 31079
Fuel Supplier	TBD	TBD
Inuvialuit Water Board	General Enquiries	(867) 678-2942
GNWT Municipal and Community Affairs	Fire Marshall	(867) 873-7469
	Emergency Measures (24 Hour)	(867) 873-7554 (24 Hour)
RCMP – Aklavik	Emergency Line	(867) 978-1111
Fire Department - Aklavik	Emergency Line	(867) 978-2222
GNWT Department of Lands - Inuvik	Beaufort-Delta Region	(867) 777-8900
Department of Fisheries and Oceans - Inuvik	Inuvik Office	(867) 777-7500

11.0 ACTION PLAN



The contact information for the foreman / site supervisor can be updated once the contractor has been selected.

11.1 Initial Actions

The following actions should be taken by the first person(s) who identifies a spill:

1. Be alert and consider your safety and the safety of others around you.
2. If possible, identify the spilled contaminant.
3. Assess the hazard to persons in the area of the spill.
4. If possible, without further assistance, control any danger to human life or the environment.
5. Assess whether the spill can be readily stopped or brought under control.
6. If safe to do so, and if possible, try to stop the spillage of contaminants.
7. Gather information about the status of the situation.
8. Report the spill immediately to Moshiur Rahman, Tel: (867) 767-9084 ext. 31079.
9. GNWT to report the spill to the 24-Hour Emergency Spill Report Line: **(867) 920-8130**. Receive instructions on the preferred collection, disposal (e.g., storage in sealed refuge containers, incineration or deposit in a designated lined containment area on land), and remediation method from the appropriate contact agencies listed in Table 10-2.
10. Resume any effective action to contain, clean up or stop the flow of spilled contaminant.

11.2 Fuel Spills on Land

1. Refer to Section 11.1 for initial actions that should be taken by the first person(s) who identifies a spill.
2. First responder or his designate will obtain plastic tarp(s), absorbent sheeting, Multi Sorb or other ultra-dry absorbent and any other necessary spill containment equipment, pump, hoses, etc. from on-site Spill Kit.
3. If the spill is small, deploy hydrophobic (water repellent) absorbent pads on spill site. Hydrophobic pads readily absorb hydrocarbons. Alternatively, an ultra-dry absorbent may be deployed.
4. A berm of peat, native soil or snow will be constructed down slope of the seepage or spill if possible.
5. The tarp will be placed in such a way that the fuel can pool for collection and removal (e.g., at the foot of the berm). If there is a large volume of spilled product, pump the liquid into refuge containers, and dispose of product as advised by the NWT 24-Hour Spill Report Line.
6. Petroleum product sheen on vegetation may be controlled by applying a thin dusting of Multi Sorb or other ultra-dry absorbent to the ground cover.
7. Saturated material will be disposed of in a refuge container, which is then labeled and sealed. Alternatively, the pads may be wrung out into the refuge container(s) and the containers marked and then secured for eventual disposal at a facility off site that accepts hazardous wastes. Contaminated soil or other vegetation may be excavated and hauled off site for disposal / remediation in a facility equipped for handling hazardous wastes.

11.3 Fuel Spills in Water

In the unlikely event of fuel spills into water, the following procedure will be implemented.

1. If not already done so, refer to Section 11.1 for initial actions that should be taken by the first person(s) who identifies a spill.
2. If the spill is small, deploy hydrophobic (water repellent) absorbent pads on the water. Hydrophobic pads readily absorb hydrocarbons. Alternatively, an ultra-dry absorbent designed for use on water-based spills may be deployed.
3. If the spill is larger, ready several containers to act as refuge containers for the spill.
4. Deploy containment booms on the water surface to “fence in” the spill area gradually and to prevent it from spreading. Keep in mind environmental factors such as high winds, precipitation and runoff can adversely affect attempts at spill cleanup.
5. Absorbent booms can be deployed to encircle and then absorb any hydrocarbon spillage that may have escaped the containment boom.
6. Once a boom has been secured, a pump may be brought on-scene to aid in capture of the hydrocarbon; once captured, the product should be pumped to a refuge container, which is then labeled and sealed and held for disposal. Wastes may be transferred in a secure container to a facility equipped for handling hazardous wastes.

11.4 Fuel Spills on Snow and Ice

1. If not already done so, refer to Section 11.1 for initial actions that should be taken by the first person(s) who identifies a spill.
2. Assess the nature of the spill. Necessary equipment might include shovels, plastic tarp(s), and refuge containers.
3. Construct a compacted-snow berm around the edge of the spill area.
4. Shovel or scrape contaminated snow and deposit in empty refuge containers.
5. If the spill is more extensive, install compacted snow berms with plastic over top, around the affected area. Although hard ice will retard or prevent fuel entry to the receiving waters below, all contaminated snow and ice, as well as objects embedded in the ice (such as gravel or frozen absorbent pads) must be scraped from the ice surface and disposed of in refuge container, which is then labeled and sealed. Wastes may be transferred in a secure container to a facility equipped for handling hazardous wastes.

12.0 SPILL RESPONSE EQUIPMENT

A complete spill kit will be kept on hand at the Project site. The Typical spill kit inventory includes:

- MSDS sheets for potential contaminants;
- Oil absorbent pads, socks, and booms;
- Safety googles;

- Disposable coveralls;
- Gap Seal compounds;
- Disposable refuse bags and containers;
- Nitrile gloves;
- Containment drum with quick release lever lock system;
- Folding spill containment shovel;
- Plastic tarps; and
- Multi-sorb or other ultra-dry absorbent.

In addition to the spill kit, general construction communications equipment will be present on-site during construction. Typical general construction communications equipment includes:

- Cell phones;
- An office phone; and
- Radios.

13.0 PROCEDURES FOR CLEAN-UP AND RESTORATION OF AFFECTED AREAS

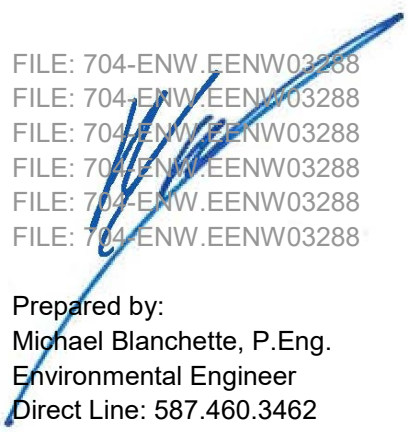
Typically, following a spill on a construction site, the following procedures are implemented for transferring, storing, and managing spill-related wastes.

- During clean-up, workers to be protected by wearing protective clothing, which may include rubber boots and chemical-resistant gloves.
- Collect all pads or other materials used for spill absorption and transfer to a labelled refuse container separated from other waste. Waste to be transferred to an approved facility that accepts hazardous wastes.
- Waste materials or different types are not to be mixed (e.g., sorbent pads and contaminated soil/snow to be stored separately).
- Spill area is to be reviewed for any sign of further contamination. In large spills, this may require the input from an environmental specialist to verify the clean-up of the site is satisfactory.
- Spill area is to be scarified and re-vegetated (if necessary) and restored to pre-existing conditions.

14.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,



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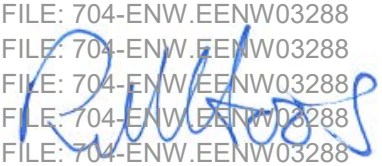

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REFERENCES

Indian and Northern Affairs Canada (INAC). 2007. Guidelines for Spill Contingency Planning. Water Resources Division, INAC, Yellowknife, NT Available online: http://www.aadnc-aandc.gc.ca/eng/1100100024236/1100100024253

APPENDIX D-1
SITE DRAWINGS

GOVERNMENT of NORTHWEST TERRITORIES

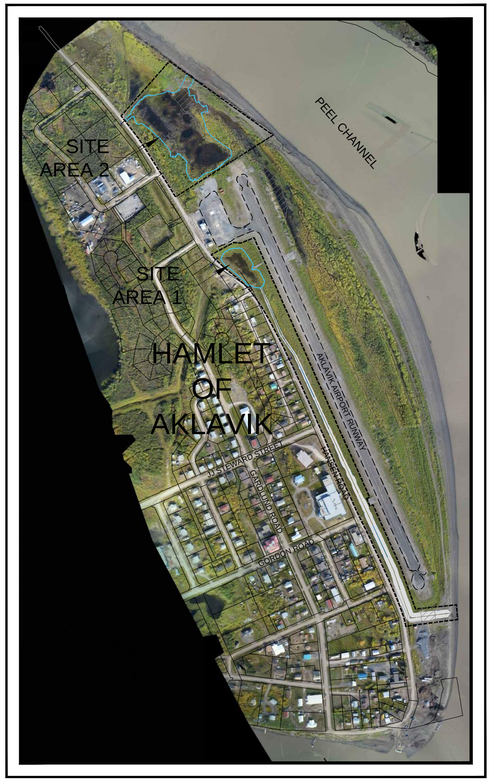
AKLAVIK AIRPORT DRAINAGE

IN THE

HAMLET of AKLAVIK, NORTHWEST TERRITORIES

ISSUED FOR ENVIRONMENTAL REVIEW

LIST OF DRAWINGS:

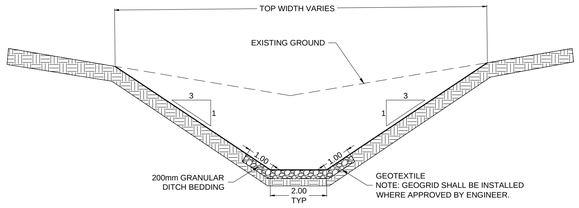


LOCATION PLAN

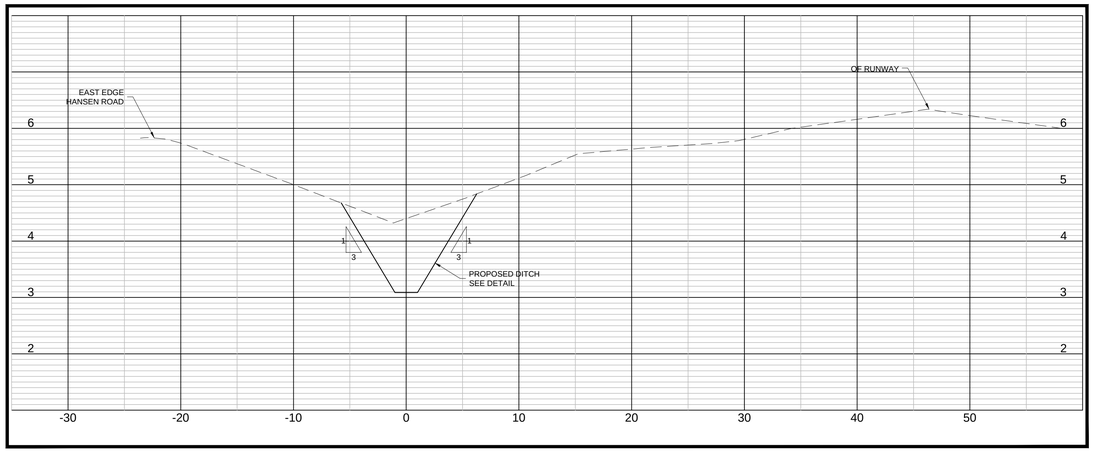
N.T.S.

E00724A

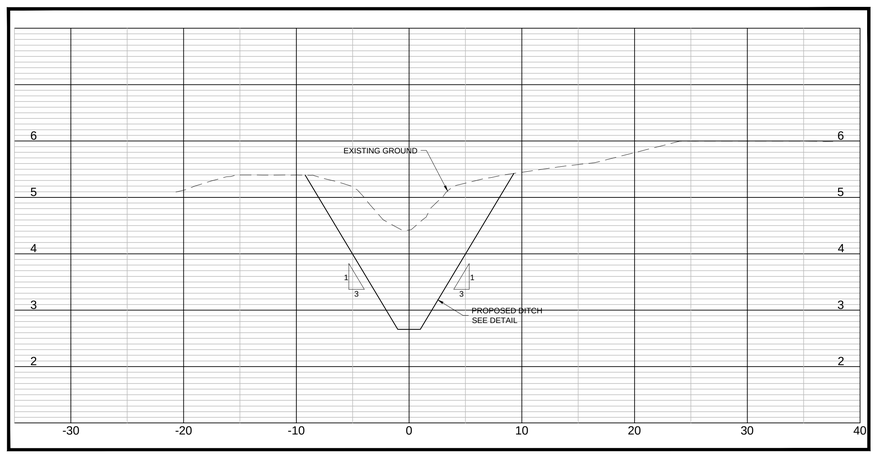
AREA 1
DRAINAGE IMPROVEMENTS
SCALE 1:2000



TYPICAL DITCH CROSS SECTION
INSTALLATION DETAIL
NOT TO SCALE



PROPOSED DITCH
CROSS SECTION A-A
H 1:250 V 1:50



PROPOSED DITCH
CROSS SECTION B-B
H 1:250 V 1:50

LEGEND

- PROPOSED SITE BOUNDARY — BOUNDARY IS EAST EDGE OF GRAVEL ON HANSEN ROAD & 15m FROM WEST EDGE OF RUNWAY EXCEPT AS SHOWN.
- PROPOSED DRAINAGE IMPROVEMENTS
- EXISTING DRAINAGE PATH
- PROPOSED DRAINAGE PATH
- N68°13'31.72" W135°00'41.49" — GPS COORDINATES DMS (DEGREES, MINUTES, SECONDS) NOTE: WESTING IS NEGATIVE

No.	Date	Description	By
1	2018/10/02	ISSUED FOR ENVIRONMENTAL REVIEW	RFC

STAMPS:

REGISTERED PROFESSIONAL ENGINEER — R.F. CADIEUX — LICENSEE — YR. 18 MN. 02 DAY — NT / NU

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2018-10-02
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

DESIGNED BY APPROVED BY

ENGINEER: E00724A

CIMA+
T 306 653-2462, F 888 478-7420
4th Floor-333 3rd Avenue North
Saskatoon, SK S7K 2M2 CANADA

CLIENT:
GOVERNMENT of
NORTHWEST TERRITORIES

PROJECT NAME:
AKLAVIK AIRPORT DRAINAGE

SHEET TITLE:
AREA 1
DRAINAGE IMPROVEMENTS

DISCIPLINE:
INFRASTRUCTURE

DRAFTER: KRD	SCALE: AS SHOWN
DESIGNER: RFC	DATE: 2018/06/29
APPROVER: -	APPROVER: -
PROJECT No: E00724A	DRAWING No: 1
SHEET No: 1 of 9	

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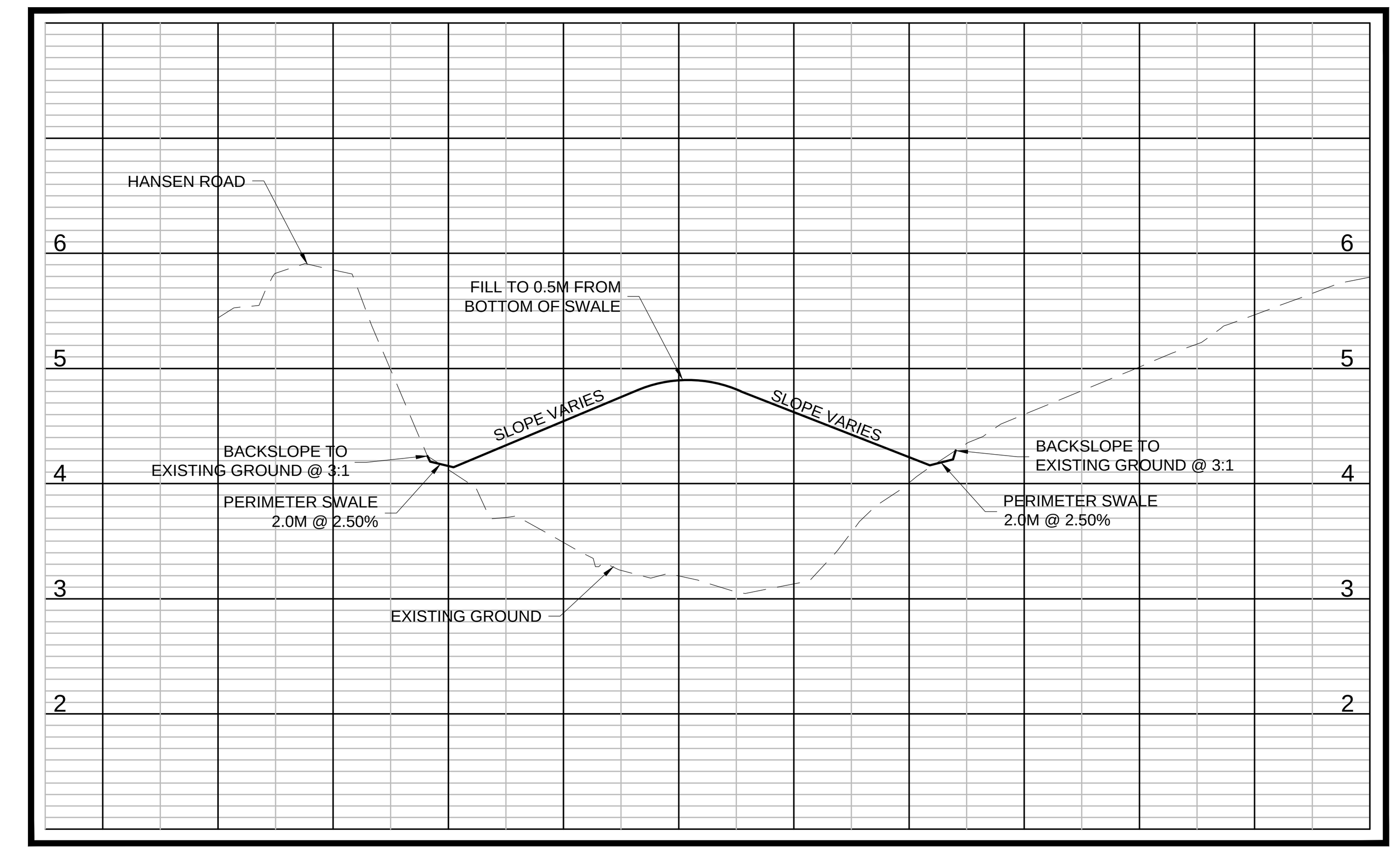
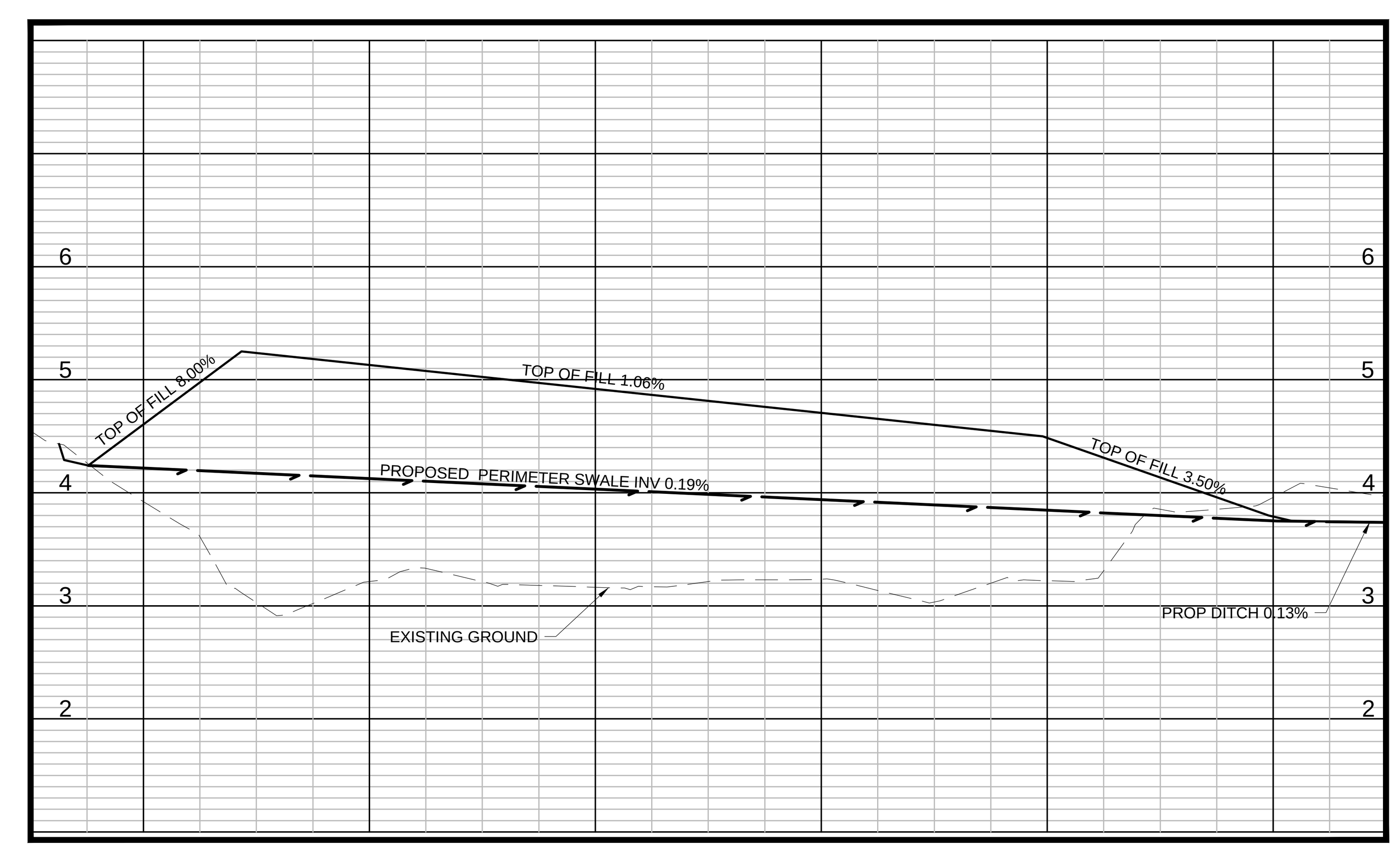
AREA 1
GRADING PLAN
SCALE 1:250



AREA 1
CROSS SECTION A-A
H 1:500 V 1:50



AREA 1
CROSS SECTION B-B
H 1:500 V 1:50

LEGEND

- 1.00 — EXISTING CONTOUR 1.00 METRE INTERVAL
- EXISTING CONTOUR 0.25 METRE INTERVAL
- FLOW DIRECTION
- 4.00 × EXISTING GROUND ELEVATION
- 4.00 × DESIGN ELEVATION

No.	Date	Description	By
1	2018/10/02	ISSUED FOR ENVIRONMENTAL REVIEW	RFC

STAMPS:

REGISTERED PROFESSIONAL ENGINEER
R.F. CADIEUX
LICENSEE
18 10 02
YR. MN. DAY
NT / NU

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2018-10-02
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

DESIGNED BY APPROVED BY

ENGINEER: E00724A

CIMA+

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4th Floor-333 3rd Avenue North
Saskatoon, SK S7K 2M2 CANADA

CLIENT:

GOVERNMENT of
NORTHWEST TERRITORIES

PROJECT NAME:

AKLAVIK AIRPORT DRAINAGE

SHEET TITLE:

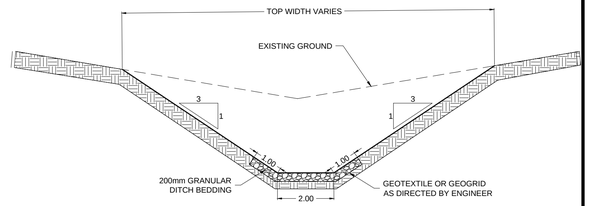
AREA 1
GRADING PLAN

DISCIPLINE:

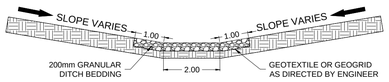
INFRASTRUCTURE

DRAFTER: KRD	SCALE: 1:250
DESIGNER: RFC	DATE: 2018/06/29
APPROVER: -	APPROVER: -
PROJECT No: E00724A	DRAWING No: 2
SHEET No: 2 of 9	

AREA 2
DRAINAGE IMPROVEMENTS
&
GRADING PLAN
SCALE 1:500



TYPICAL DITCH CROSS SECTION
NOT TO SCALE



TYPICAL SWALE CROSS SECTION - AREA 2
NOT TO SCALE

LEGEND

- EXISTING CONTOUR 1.00 METRE INTERVAL
- EXISTING CONTOUR 0.25 METRE INTERVAL
- FLOW DIRECTION
- EXISTING GROUND ELEVATION
- DESIGN ELEVATION
- GPS COORDINATES DMS (DEGREES, MINUTES, SECONDS) NOTE: WESTING IS NEGATIVE

No.	Date	Description	By
1	2018/10/02	ISSUED FOR ENVIRONMENTAL REVIEW	RFC

STAMPS:

REGISTERED PROFESSIONAL ENGINEER
R.F. CADIEUX
LICENSEE
YR. MN. DAY
NT / NU

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2018-10-02
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

DESIGNED BY APPROVED BY

ENGINEER: E00724A

T 306 653-2462, F 888 478-7420
4th Floor-333 3rd Avenue North
Saskatoon, SK S7K 2M2 CANADA

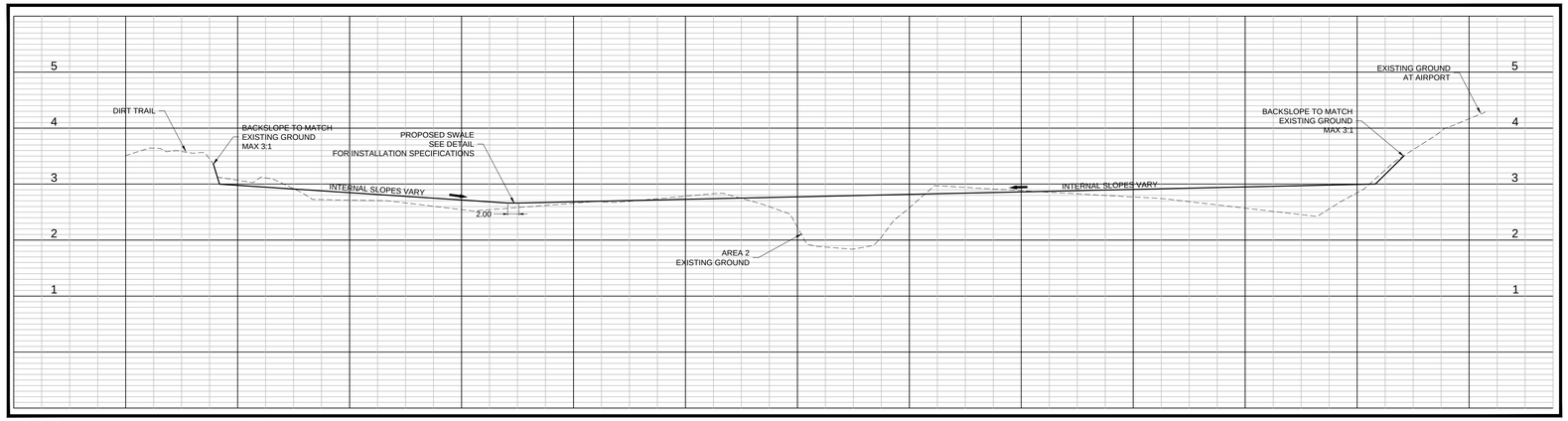
CLIENT:
GOVERNMENT of
NORTHWEST TERRITORIES

PROJECT NAME:
AKLAVIK AIRPORT DRAINAGE

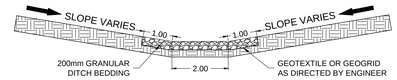
SHEET TITLE:
AREA 2
DRAINAGE IMPROVEMENTS
&
GRADING PLAN

DISCIPLINE:
INFRASTRUCTURE

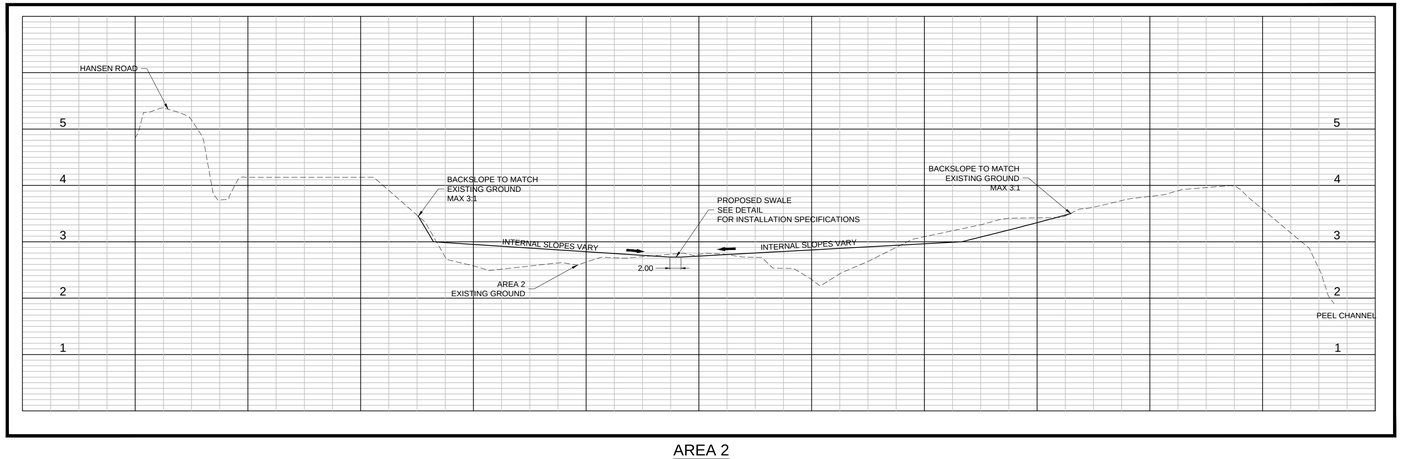
DRAFTER: KRD	SCALE: AS SHOWN
DESIGNER: RFC	DATE: 2018/06/29
APPROVER: -	APPROVER: -
PROJECT No: E00724A	DRAWING No: 3
SHEET No: 3 of 9	



AREA 2
CROSS SECTION A-A
H 1:500 V 1:50



TYPICAL SWALE CROSS SECTION - AREA 2
NOT TO SCALE



AREA 2
CROSS SECTION B-B
H 1:500 V 1:50

LEGEND

No.	Date	Description	By
1	2018/10/02	ISSUED FOR ENVIRONMENTAL REVIEW	RFC

STAMPS:

REGISTERED PROFESSIONAL ENGINEER
R.F. CADIEUX
LICENSEE
18 12 02
YR. MN. DAY
NT / NU

PERMIT TO PRACTICE
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Saskatoon, SK S7K 2M2 CANADA

CLIENT:
GOVERNMENT of
NORTHWEST TERRITORIES

PROJECT NAME:
AKLAVIK AIRPORT DRAINAGE

SHEET TITLE:
AREA 2
CROSS SECTIONS

DISCIPLINE:
INFRASTRUCTURE

DRAFTER: KRD	SCALE: AS SHOWN
DESIGNER: RFC	DATE: 2018/06/29
APPROVER: -	APPROVER: -
PROJECT No: E00724A	DRAWING No: 4
SHEET No: 4 of 9	

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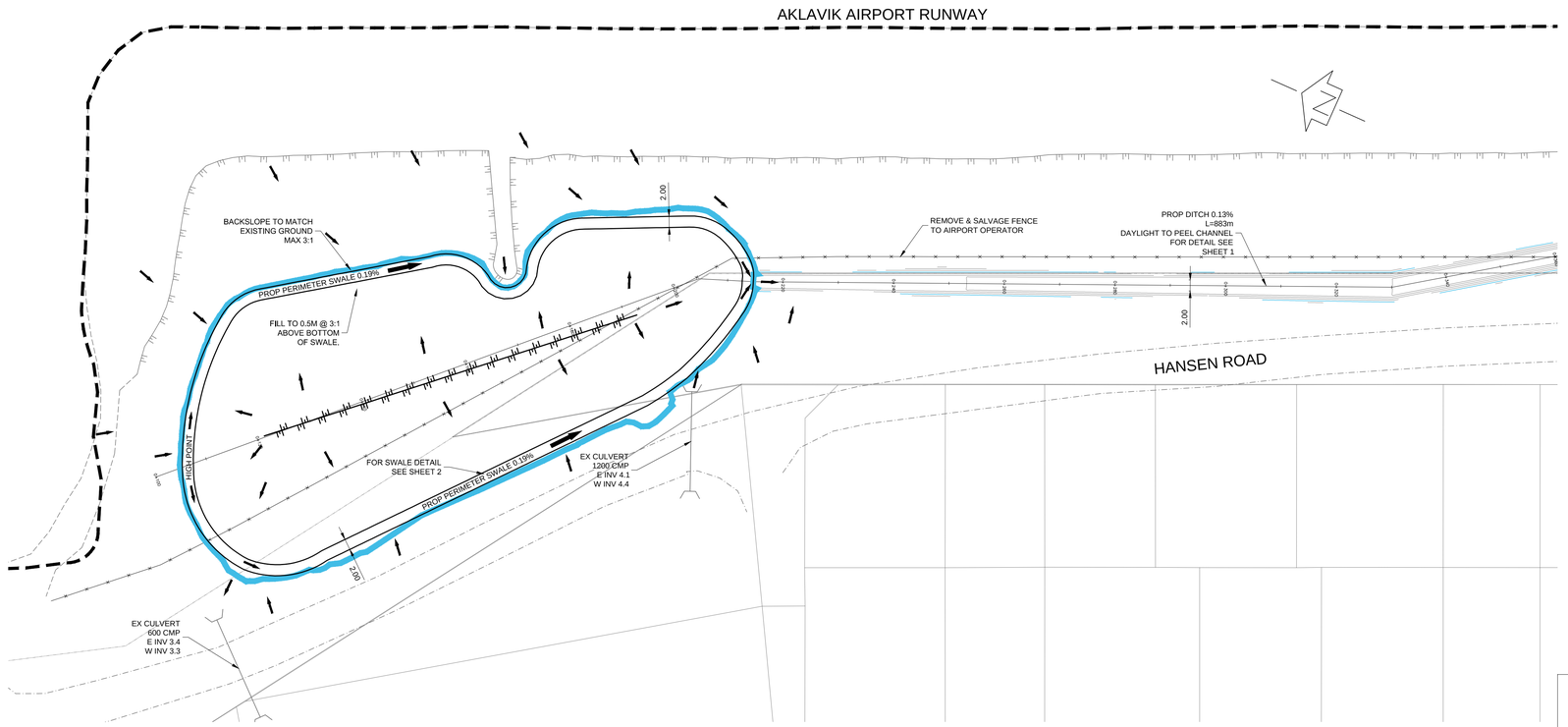

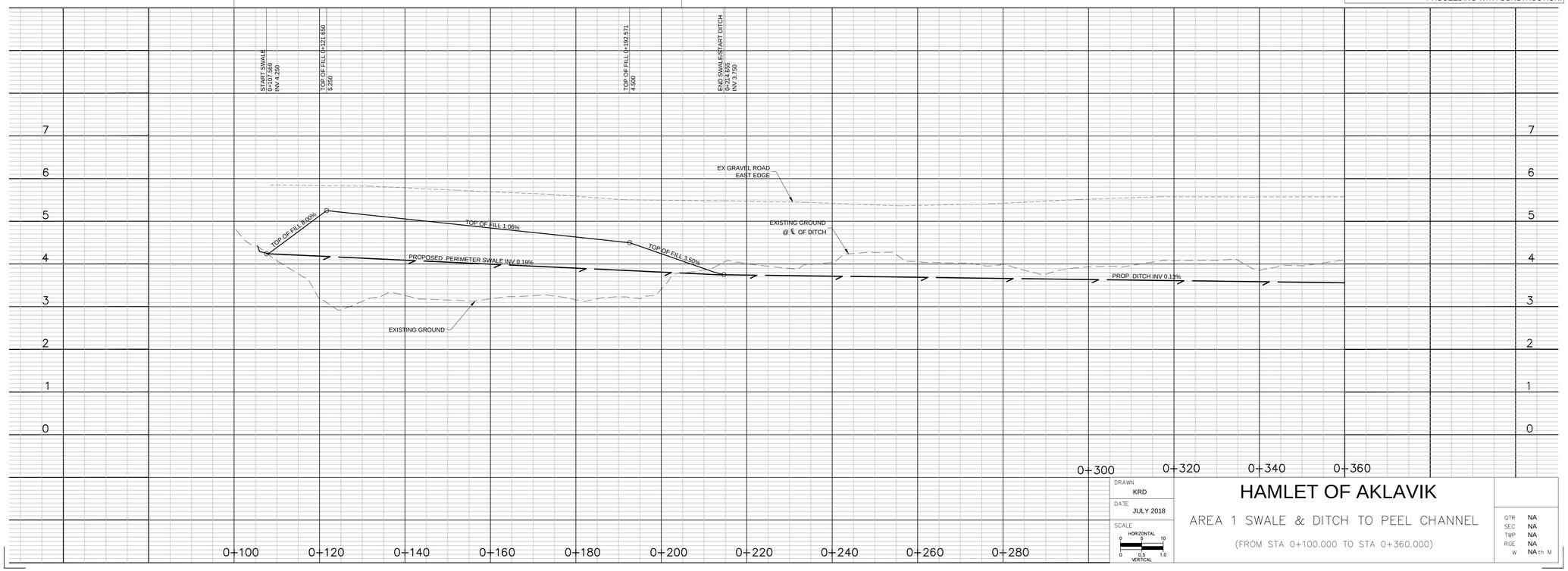

NAD 83
COORDINATES

NOTE :
ALL PIPE SIZES ARE IN MILLIMETERS AND ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.

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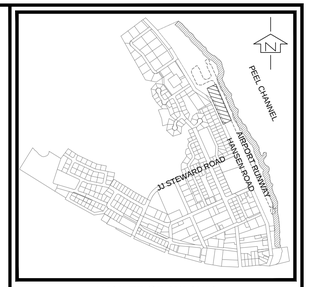
DRAWN: KRD
DATE: JULY 2018
SCALE: HORIZONTAL 0 5 10 / VERTICAL 0 0.5 1.0

HAMLET OF AKLAVIK

AREA 1 SWALE & DITCH TO PEEL CHANNEL

(FROM STA 0+100.000 TO STA 0+360.000)

QTR NA
SEC NA
TWP NA
RGE NA
W NA th M



HAMLET OF AKLAVIK

LOCATION PLAN
SCALE : NTS

PROFILE LOCATION

No.	Date	Description	By
1	2018/10/02	ISSUED FOR ENVIRONMENTAL REVIEW	RFC

STAMPS:

REGISTERED PROFESSIONAL ENGINEER — R.F. CADIEUX — LICENSEE — 18 10 02 YR. MN. DAY — NT / NU

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2018-10-02
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

DESIGNED BY — APPROVED BY

ENGINEER: E00724A

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Saskatoon, SK S7K 2M2 CANADA

CLIENT:
GOVERNMENT of NORTHWEST TERRITORIES

PROJECT NAME:
AKLAVIK AIRPORT DRAINAGE

SHEET TITLE:
BLOCK PROFILE

DISCIPLINE:
INFRASTRUCTURE

DRAFTER: KRD	SCALE: H 1:500 V 1:100
DESIGNER: RFC	DATE: 2018/07/10
APPROVER: -	APPROVER: -
PROJECT No: E00724A	DRAWING No: 501
SHEET No: 5 of 9	

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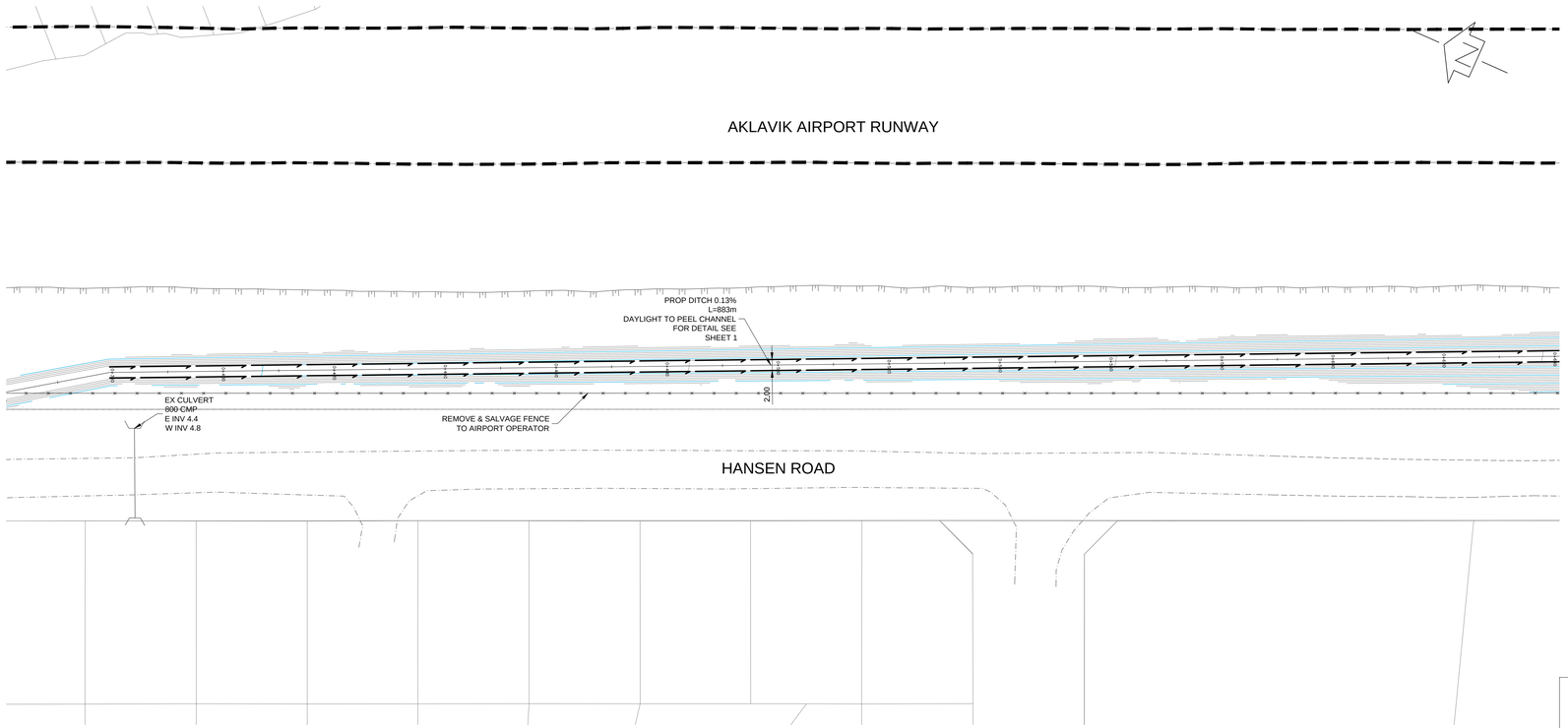

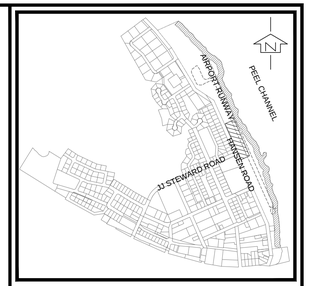

HAMLET OF AKLAVIK

LOCATION PLAN
SCALE : NTS

PROFILE LOCATION

NAD 83
COORDINATES

NOTE :
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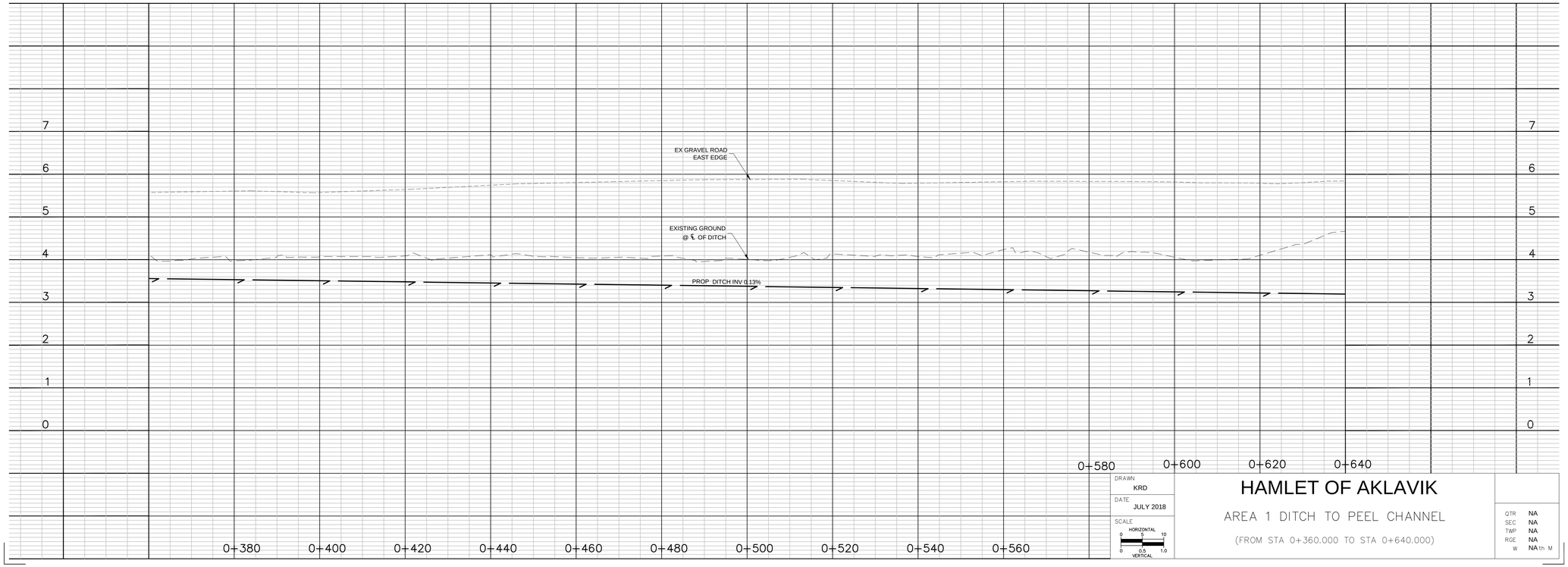


1	2018/10/02	ISSUED FOR ENVIRONMENTAL REVIEW	RFC
No.	Date	Description	By

STAMPS:

REGISTERED PROFESSIONAL ENGINEER — R.F. CADIEUX — LICENSEE — 18 10 02 YR. MN. DAY — NT / NU

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2018-10-02
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

DESIGNED BY | APPROVED BY

ENGINEER: E00724A

T 306 653-2462, F 888 478-7420
4th Floor-333 3rd Avenue North
Saskatoon, SK S7K 2M2 CANADA

CLIENT:
GOVERNMENT of NORTHWEST TERRITORIES

PROJECT NAME:
AKLAVIK AIRPORT DRAINAGE

SHEET TITLE:
BLOCK PROFILE

DISCIPLINE:
INFRASTRUCTURE

DRAFTER: KRD	SCALE: H 1:500 V 1:100
DESIGNER: RFC	DATE: 2018/07/10
APPROVER: -	APPROVER: -
PROJECT No: E00724A	DRAWING No: 502
SHEET No: 6 of 9	

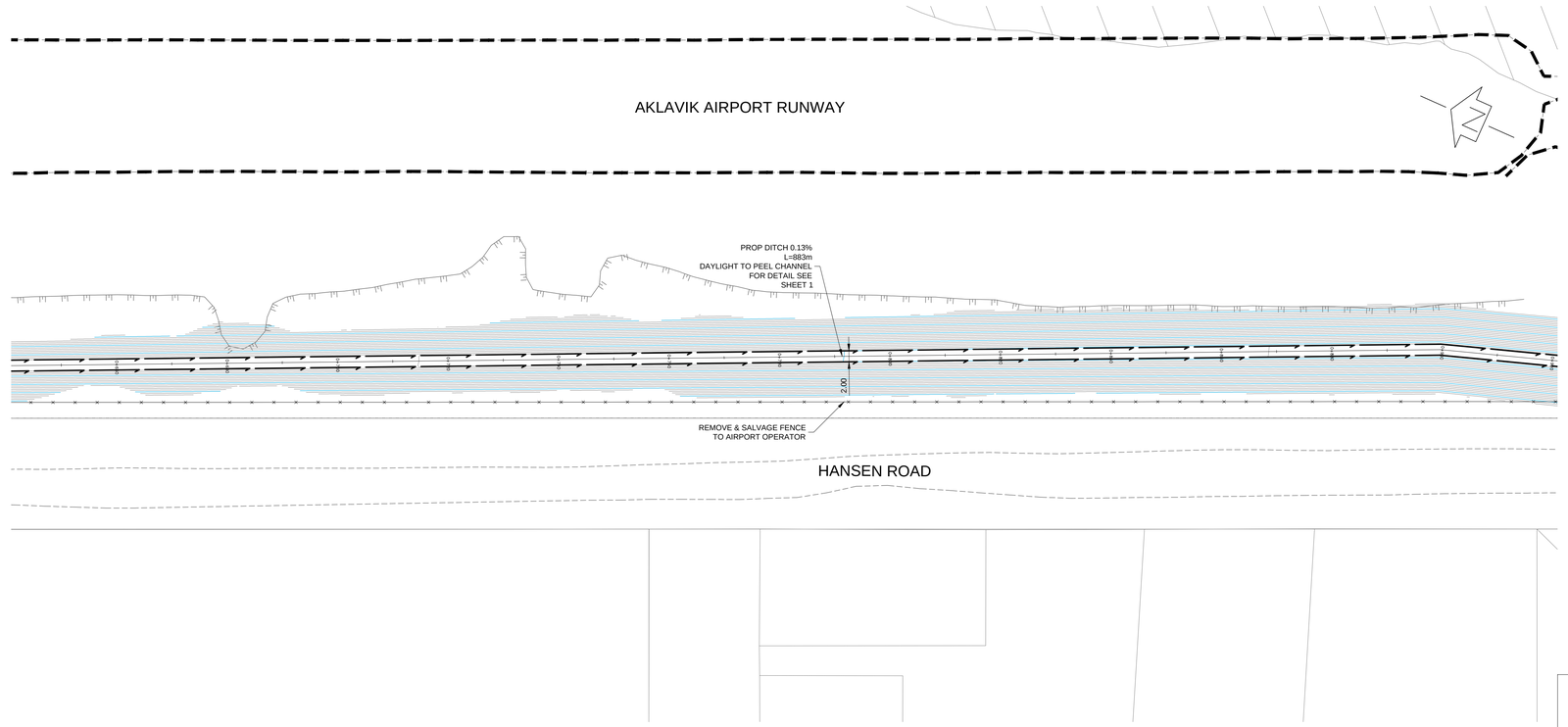
DRAWN: KRD
DATE: JULY 2018
SCALE: HORIZONTAL 0 5 10 / VERTICAL 0 0.5 1.0

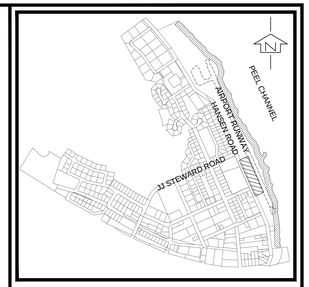
HAMLET OF AKLAVIK

AREA 1 DITCH TO PEEL CHANNEL

(FROM STA 0+360.000 TO STA 0+640.000)

QTR	NA
SEC	NA
TWP	NA
RGE	NA
W	NA th M





HAMLET OF AKLAVIK

LOCATION PLAN

SCALE : NTS

PROFILE LOCATION

NAD 83
COORDINATES

NOTE :
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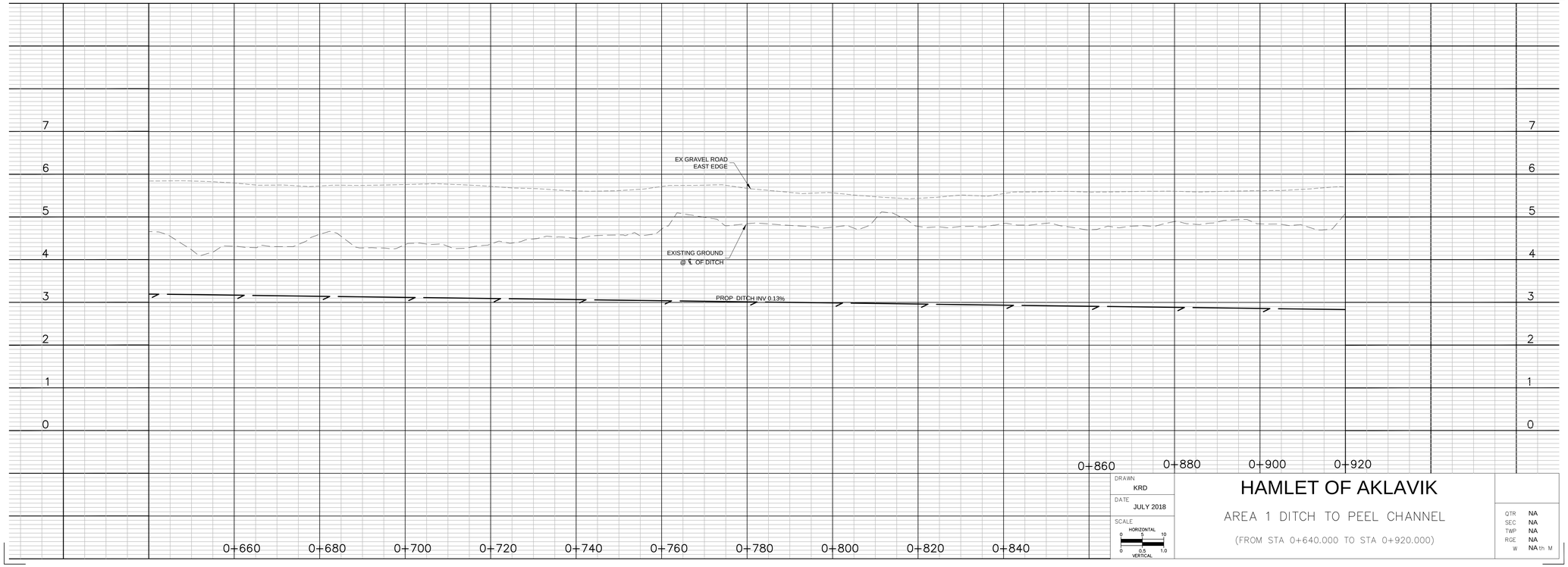

DRAWN: KRD

DATE: JULY 2018

SCALE: HORIZONTAL 0 5 10 / VERTICAL 0 0.5 1.0

HAMLET OF AKLAVIK

AREA 1 DITCH TO PEEL CHANNEL

(FROM STA 0+640.000 TO STA 0+920.000)

QTR NA
SEC NA
TWP NA
RGE NA
W NA th M

No.	Date	Description	By
1	2018/10/02	ISSUED FOR ENVIRONMENTAL REVIEW	RFC

STAMPS:

REGISTERED PROFESSIONAL ENGINEER — R.F. CADIEUX — LICENSEE — 18 10 02 YR. MN. DAY — NT / NU

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2018-10-02
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

DESIGNED BY APPROVED BY

ENGINEER: E00724A

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4th Floor-333 3rd Avenue North
Saskatoon, SK S7K 2M2 CANADA

CLIENT:

GOVERNMENT of
NORTHWEST TERRITORIES

PROJECT NAME:

AKLAVIK AIRPORT DRAINAGE

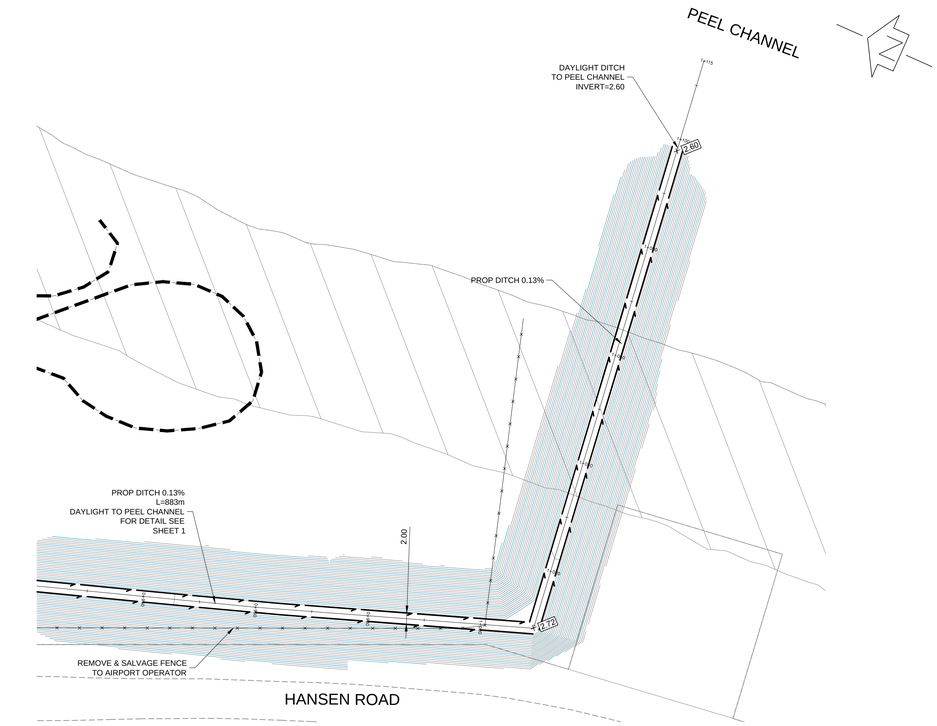
SHEET TITLE:

BLOCK PROFILE

DISCIPLINE:

INFRASTRUCTURE

DRAFTER: KRD	SCALE: H 1:500 V 1:100
DESIGNER: RFC	DATE: 2018/07/10
APPROVER: -	APPROVER: -
PROJECT No: E00724A	DRAWING No: 503
SHEET No: 7 of 9	



HAMLET OF AKLAVIK

LOCATION PLAN
SCALE : NTS

PROFILE LOCATION

NAD 83
COORDINATES

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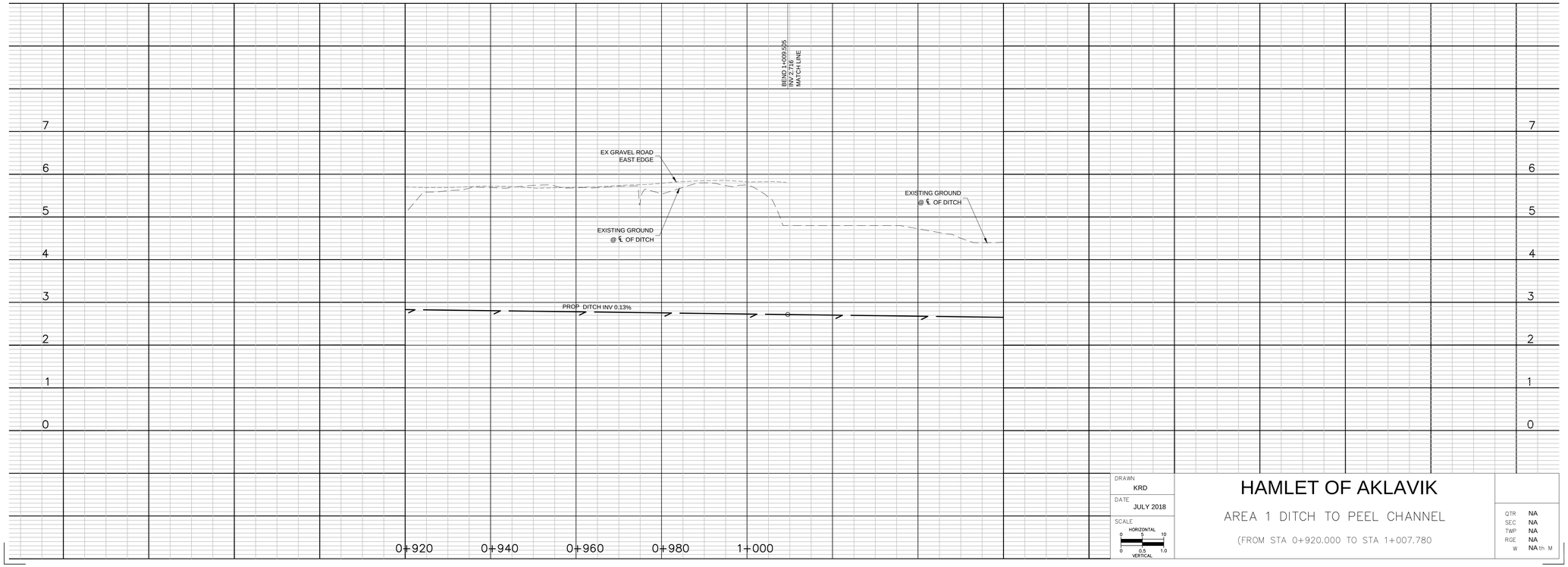

1	2018/10/02	ISSUED FOR ENVIRONMENTAL REVIEW	RFC
No.	Date	Description	By

STAMPS:

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NORTHWEST TERRITORIES

PROJECT NAME:
AKLAVIK AIRPORT DRAINAGE

SHEET TITLE:
BLOCK PROFILE

DISCIPLINE:
INFRASTRUCTURE

DRAFTER: KRD	SCALE: H 1:500 V 1:100
DESIGNER: RFC	DATE: 2018/07/10
APPROVER: -	APPROVER: -
PROJECT No: E00724A	DRAWING No: 504
SHEET No: 8 of 9	

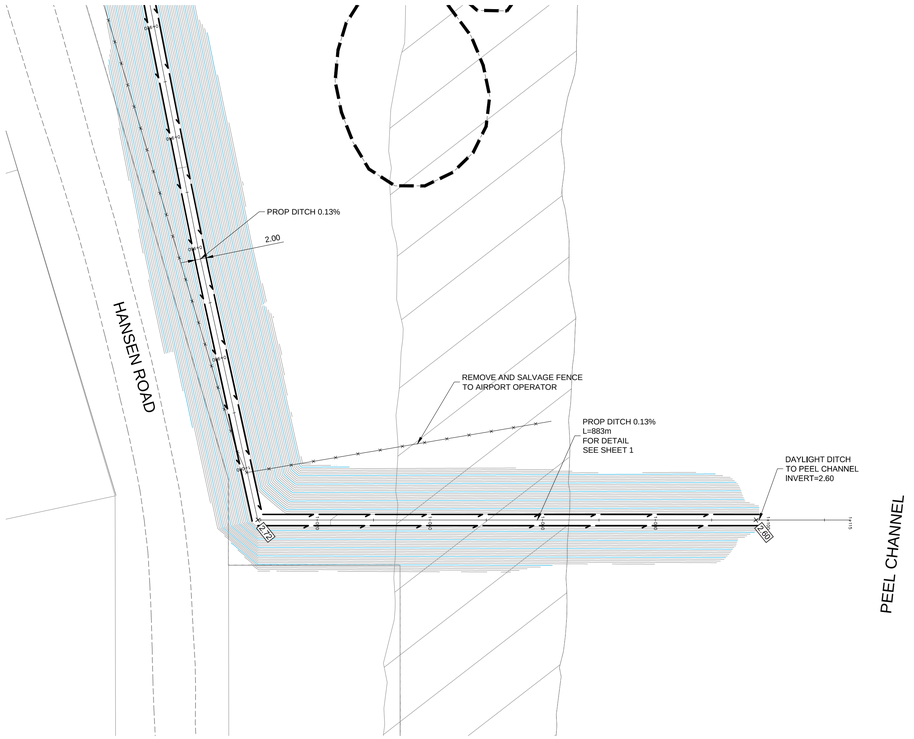
DRAWN KRD
DATE JULY 2018
SCALE HORIZONTAL 0 5 10 / VERTICAL 0 0.5 1.0

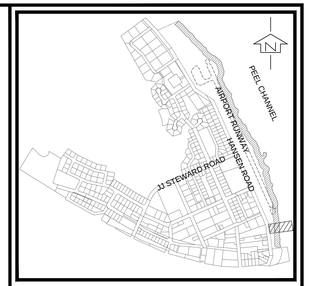
HAMLET OF AKLAVIK

AREA 1 DITCH TO PEEL CHANNEL

(FROM STA 0+920.000 TO STA 1+007.780

QTR NA
SEC NA
TWP NA
RGE NA
W NA th M





HAMLET OF AKLAVIK

LOCATION PLAN

SCALE : NTS

PROFILE LOCATION

NAD 83
COORDINATES

NOTE :
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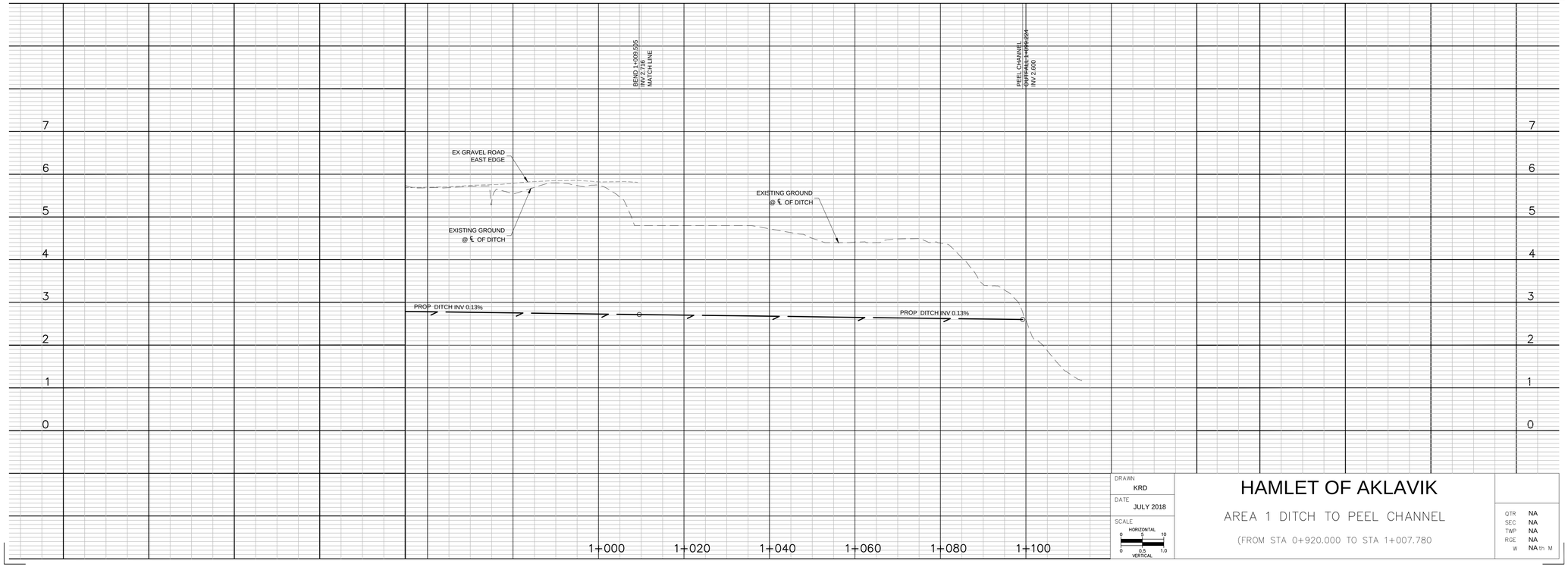

1	2018/10/02	ISSUED FOR ENVIRONMENTAL REVIEW	RFC
No.	Date	Description	By

STAMPS:

REGISTERED PROFESSIONAL ENGINEER
R.F. CADIEUX
LICENSEE
18 10 02
YR. MN. DAY
NT / NU

PERMIT TO PRACTICE
CIMA CANADA INC. o/a CIMA+
Signature
Date 2018-10-02
PERMIT NUMBER: P942
NT/NU Association of Professional Engineers and Geoscientists

DESIGNED BY APPROVED BY

ENGINEER: E00724A

T 306 653-2462, F 888 478-7420
4th Floor-333 3rd Avenue North
Saskatoon, SK S7K 2M2 CANADA

CLIENT:

GOVERNMENT of
NORTHWEST TERRITORIES

PROJECT NAME:

AKLAVIK AIRPORT DRAINAGE

SHEET TITLE:

BLOCK PROFILE

DISCIPLINE:

INFRASTRUCTURE

DRAFTER: KRD	SCALE: H 1:500 V 1:100
DESIGNER: RFC	DATE: 2018/07/10
APPROVER: -	APPROVER: -
PROJECT No: E00724A	DRAWING No: 505
SHEET No: 9 of 9	

DRAWN KRD

DATE JULY 2018

SCALE HORIZONTAL 0 5 10 / 0 0.5 1.0 VERTICAL

HAMLET OF AKLAVIK

AREA 1 DITCH TO PEEL CHANNEL

(FROM STA 0+920.000 TO STA 1+007.780

QTR	NA
SEC	NA
TWP	NA
RGE	NA
W	NA th M

APPENDIX D-2
MSDS SHEETS

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name:	Acetylene	**Trade Name:**	Acetylene
Product Use:	Metal industry: Welding and cutting of metals.		
Chemical Name:	Acetylene	**Synonym:**	Acetylen, Ethine, Ethyne, Narcylene
Chemical Formula:	C_2H_2	**Chemical Family:**	Alkyne
Telephone:	**Emergencies:** * 1-800-363-0042	**Supplier /Manufacture:**	Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2
		Phone:	905-803-1600
		Fax:	905-803-1682

**Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.*

2. Hazards Identification

Emergency Overview

DANGER! **Flammable gas under pressure. Can form explosive mixtures with air. Fusible plugs in top, bottom, or valve melt at 98 - 104 C. Do not discharge at pressures above 103 kPa. May cause dizziness and drowsiness. Self-contained breathing apparatus may be required by rescue workers. At normal temperature and pressure, commercial acetylene is a colourless gas with a distinctive garlic-like odour.**

ROUTES OF EXPOSURE: Inhalation.

EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

INHALATION: Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headaches, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconciousness. The vapour from a liquid (acetone) release may also cause incoordination and abdominal pain. Lack of oxygen can kill.

SKIN CONTACT: No harm expected. Liquid (acetone) may cause frostbite.

SKIN ABSORPTION: No harm expected. Liquid (acetone) may cause frostbite.

SWALLOWING: An unlikely route of exposure, but frostbite of the lips and mouth may result from contact with the liquid (acetone). If swallowed, the liquid may cause nausea.

EYE CONTACT: Vapour containing acetone may cause irritation. Liquid (acetone) may cause irritation and frosbite.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:

NOTE: Acetylene cylinders are filled with a porous material containg acetone into which the acetylene is dissolved. ACGIH has established a TLV-TWA of 500 ppm for acetone and a STEL of 750 ppm.

WORKING WITH WELDING AND CUTTING MAY CREATE ADDITIONAL HEALTH HAZARDS. FUMES AND GASES can be dangerous to your health and may cause serious lung disease.* Keep your head out of the fumes. Do not breathe fumes and gases caused by the process. Use enough ventilation, local exhaust, or both to keep fumes and gases from your breathing zone and the general area. The type and amount of fumes and gases depend on the equipment and supplies used. Possibly dangerous materials may be found in fluxes, coatings, gases, metals etc. Obtain a Material Safety Data Sheet (MSDS) for each material used. Air samples can be used to find out what respiratory protection is needed. Short term overexposure to fumes may result in discomfort such as dizziness, nausea, or dryness or irritation of nose, throat, or eyes.

***NOTES TO PHYSICIAN:**

Acute: Gases, fumes, and dusts may cause irritation to the eyes, lungs, nose, and throat. Some toxic gases associated with welding and related processes may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, difficulty breathing frequent coughing, or chest pains.

Chronic: Protracted inhalation of air contaminants may lead to their accumulation in the lungs, a condition which may be seen as dense areas on chest x-rays. The severity of change is proportional to the length of exposure. The changes seen are not necessarily associated with symptoms or signs of reduced lung function or disease. In addition, the changes on x-rays may be caused by non-work related factors such as smoking, etc.

OTHER EFFECTS OF OVEREXPOSURE:

None known.

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

Repeated or prolonged exposure is not known to aggravate medical condition.

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:

None

CARCINOGENICITY:

Not listed as carcinogen by OSHA, NTP or IARC.

3. Composition and Information on Ingredients

COMPONENTS	CAS NUMBER	CONCENTRATION % by Mole
Acetylene	74-86-2	>99.9*

*Note: Acetylene cylinders are filled with a porus material containing acetone (CAS 67-64-1)into which the acetylene is dissolved.

4. First Aid Measures

INHALATION:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

SKIN CONTACT:

In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

SWALLOWING:

If liquid is swallowed, do not induce vomiting. Call a physician.

EYE CONTACT:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. See a physician, preferably an ophthalmologist, immediately.

NOTES TO PHYSICIAN:

Aspired acetone may cause severe lung damage. If a large quantity of material has been swallowed, stomach contents should be evacuated quickly in a manner which avoids aspiration. Otherwise, treatment should be directed at the control of symptoms and the clinical condition. No specific antidote is known.

5. Fire Fighting Measures

FLAMMABLE : Yes. **IF YES, UNDER WHAT CONDITIONS?** See "Unusual Fire and Explosion Hazards" in this section.

EXTINGUISHING MEDIA: See paragraphs below.

PRODUCTS OF COMBUSTION: These products are carbon oxides (CO, CO2).

PROTECTION OF FIREFIGHTERS:

DANGER! Refer to CGA safety bulletin SB-4, "Handling Acetylene Cyinders in Fire Situations". Evacuate all personnel from danger area. Immediately cool containers with water spray from maximum distance taking care not to extinguish flames. Remove ignition sources if without risk. If flames are accidently extinguished, explosive re-ignition may occur. Use self-contained breathing apparatus. Stop flow of gas if without risk while continuing cooling water spray. Remove all containers from area of fire if without risk. Allow fire to burn out.

SPECIFIC PHYSICAL AND CHEMICAL HAZARDS:

Extremely flammable gas. Forms explosive mixtures with air and oxidizing agents. Container may rupture due to heat of fire. Do not extinguish flames due to possibility of explosive re-ignition. No part of a container should be subjected to temperature higher than 52 C. Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature. Contact with copper, silver, or mercury or their alloys or halogens can cause explosion. Vapours form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with approved device.

SENSITIVITY TO IMPACT:

Avoid impact against container.

SENSITIVITY TO STATIC DISCHARGE:

Possible, See Section 7.

PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS:

Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.

FLAMMABLE LIMITS IN AIR, % by volume:

LOWER: 2.5 **UPPER:** 100

FLASH POINT: CLOSED CUP: -17.8°C (0°F). (Tag)

AUTOIGNITION TEMPERATURE: 305°C (581°F)

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Personal Precautions:

DANGER! **Flammable, high-pressure gas.** Forms explosive mixtures with air. Immediately evacaute all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if without risk. Reduce gas with fog or fine water spray. Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area. Flammable gas may spread from leak. Before entering area, especially confined areas, check atmosphere with an appropriate device.

Environmental Precautions:

Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, provincial, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING:

Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. All piped acetylene systems and associated equipment must be grounded. Electrical equipment must be non-sparking or explosion-proof. Leak check with soapy water; never use a flame. Never use copper piping for acetylene service; use only steel or wrought iron. Open acetylene cylinder valves the minimum amount required for acceptable flow; this will allow you to close valves as quickly as possible in an emergency. Do not open acetylene cylinder valves more than 1½ turns. Never use acetylene at pressures exceeding 103.5 kPa (15 psig). Acetylene cylinders are heavier than other cylinders because they are packed with a porous material and acetone. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier. For other precautions in using acetylene, see section 16.

PRECAUTIONS TO BE TAKEN IN STORAGE:

Store and use with adequate ventilation. Separate flammable cylinders from oxygen, chlorine, and other oxidizers by at least 6.1 m or use a barricade of non-combustible material. This barricade should be at least 1.53 m high and have a fire resistance rating of at least ½ hour. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. All electrical equipment in storage areas must be explosion-proof. Storage areas must meet national electric codes for Class 1 hazardous areas. Store only where temperature will not exceed 52 C. Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:

Flammable high-pressure gas. Use only in a closed system. Use piping and equipment adequately designed to withstand pressures to be encountered. Use only spark-proof tools and explosion-proof equipment. Keep away from heat, sparks, and open flame. ***May form explosive mixtures with air.*** Ground all equipment. ***Gas can cause rapid suffocation due to oxygen deficiency.*** Store and use with adequate ventilation. Close valve after each use; keep closed even when empty. ***Prevent reverse flow.*** *Reverse flow into cylinder may cause rupture. Use a check valve or other protective device in any line or piping from the cylinder.* ***When returning cylinder to supplier,*** *be sure valve is closed, then install valve outlet plug tightly.* ***Never work on a pressurized system.*** *If there is a leak, close the cylinder valve. Vent the system down in a safe and environmentally sound manner in compliance with all federal, provincial, and local laws; then repair the leak.* ***Never place a compressed gas cylinder where it may become part of an electrical circuit.***

RECOMMENDED PUBLICATIONS:

Additional information on storage, handling, and use of this product is provided in **NFPA 55:** ***Standard for the Storage, Use, and Handling of Compressed and Liquefied Gases in Portable Cylinders***, published by the National Fire Protection Association.

See also Praxair publication P-14-153, *Guidelines for Handling Gas Cylinders and Containers*. Obtain from your local supplier.

8. Exposure Controls/Personal Protection

INGREDIENTS	CAS NUMBER	LD_{50} (Species & Routes)	LC_{50} (Rat, 4 hrs.)	Exposure Limits
Acetylene	74-86-2	Not available.	Not available.	Simple asphyxiant.

IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH):

VENTILATION/ENGINEERING CONTROLS:

LOCAL EXHAUST: Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Train the worker to keep his head out of the fumes.

MECHANICAL (General): Use a local exhaust system, if necessary, to maintain an adequate supply of oxygen in the worker's breathing zone.

SPECIAL: Use only in a closed system.

OTHER: Use local exhaust ventilation or handle in a ventilated enclosure.

PERSONAL PROTECTION:

RESPIRATORY PROTECTION: Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV (acetone) or the applicable TLVs for fumes, gases, and other by-products of welding with acetylene. Select in accordance with the provincial regulations or guidelines. Selection should also be based on the current CSA standards Z94.4, "Selection, care and use of respirators". Respirators should be approved by NIOSH and MSHA

SKIN PROTECTION: Welding gloves recommended.

EYE PROTECTION: Wear safety glasses when handling cylinders.

Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

OTHER PROTECTIVE EQUIPMENT: Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuffless trousers should be worn outside the shoes. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines.

9. Physical and Chemical Properties

PHYSICAL STATE:	Gas.	**FREEZING POINT:**	-82.2°C (-116°F) 6170 KPa abs	**pH:**	Not applicable.
BOILING POINT	-75.2°C (-103.4°F) 6170 KPa abs	**VAPOUR PRESSURE**	4476.8 kPa (@ 20°C)	**MOLECULAR WEIGHT:**	26.04 g/mole
SPECIFIC GRAVITY: LIQUID (Water = 1)	Not applicable.	**SOLUBILITY IN WATER,**	Not applicable.		
SPECIFIC GRAVITY: VAPOUR (air = 1)	0.906	**EVAPORATION RATE** (Butyl Acetate=1):	Not applicable.	**COEFFICIENT OF WATER/OIL DISTRIBUTION:**	Not applicable.
VAPOUR DENSITY:	0.00117 g/ml @ 0 C	**% VOLATILES BY VOLUME:**	100% (v/v).	**ODOUR THRESHOLD:**	657 mg/m3

APPEARANCE & ODOUR: Colourless. Odour: Acetylene of 100% purity is odourless, but commercial acetylene has a distinctive garlic-like odour.

10. Stability and Reactivity

STABILITY:	Unstable.
CONDITIONS OF CHEMICAL INSTABILITY:	Stable as shipped. Avoid use at pressure above 15 psig.
INCOMPATIBILITY (materials to avoid):	Avoid contact with copper, silver, mercury or their alloys, oxidizing agents, acids, halogens, moisture.
HAZARDOUS DECOMPOSITION PRODUCTS:	Thermal decomposition or burning may produce carbon monoxide/carbon dioxide. The welding and cutting process may form reaction products such as carbon monoxide and carbon dioxide.
HAZARDOUS POLYMERIZATION:	Will not occur.
CONDITIONS TO AVOID:	Elevated temperatures and pressures and/or presence of a catalyst.
CONDITIONS OF REACTIVITY:	Fire or explosion mayresult from use at elevated temperatures & pressures or from use with incompatible materials.

11. Toxicological Information

ACUTE DOSE EFFECTS: No known effects from acetylene gas. The welding process may generate hazardous fumes and gases. (See section 8, 10, 15 and 16.)

STUDY RESULTS:

None known.

12. Ecological Information

No adverse ecological effects expected. This product does not contain any Class I or Class II ozone-depleting chemicals. The components of this mixture are not listed as marine pollutants by TDG Regulations.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. Transport Information

TDG/IMO SHIPPING NAME: Acetylene, dissolved

HAZARD CLASS:	IDENTIFICATION #:	PRODUCT REPORTABLE QUANTITY (PRQ):
CLASS 2.1: Flammable gas.	UN1001	Any accidental release in a quantity that could pose a danger to public safety or any sustained release of 10 minutes or more.

SHIPPING LABEL(s): Flammable gas

PLACARD (When Required): Flammable gas

SPECIAL SHIPPING INFORMATION:

Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, non-ventilated compartment of a vehicle can present serious safety hazards.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, provincial, and local regulations. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

WHMIS (Canada): CLASS A: Compressed gas.
CLASS B-1: Flammable gas.
CLASS F: Dangerously reactive material.

This product is on the DSL list.

International Regulations:

EINECS: Not available.

DSCL (EEC): This product is not classified according to the EU regulations.

International Lists: No products were found.

16. Other Information

MIXTURES:

When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

HAZARD RATING SYSTEM:

HMIS RATINGS:

HEALTH	2
FLAMMABILITY	4
PHYSICAL HAZARD	2

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	CGA-510, CGA-520, CGA-200
PIN-INDEXED YOKE:	None.
ULTRA-HIGH-INTEGRITY CONNECTION:	None.

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlets V-1 and V-7 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, Fax (703) 961-1831, website: www.cganet.com.

AV-1	Safe Handling and Storage of Compressed Gas
G-1	Acetylene
G-1.1	Commodity Specification for Acetylene
G-1.2	Recommendation for Chemical Acetylene Metering
G-1.3	Acetylene Transmission for Chemical Synthesis
P-1	Safe Handling of Compressed Gases in Containers
P-14	Accident Prevention in Oxygen-Rich, Oxygen-Deficient Atmosphere
SB-2	Oxygen-Deficient Atmospheres
V-1	Compressed Gas Cylinder Valve Inlet and Outlet Connections
V-7	Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures
---	Handbook of Compressed Gases, Fifth Edition

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

PREPARATION INFORMATION:

DATE:	**Oct 15, 2016**
DEPARTMENT:	**Safety and Environmental Services**
TELEPHONE:	**905-803-1600**

The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair Canada Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair Canada Inc. requests the users of this product to study this Material Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety nformation, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

Praxair Canada Inc.
1 City Centre Drive
Suite 1200
Mississauga, ON L5B 1M2

Universal Antifreeze/Coolant

SECTION 1. IDENTIFICATION

Product Identifier	Universal Antifreeze/Coolant
Other Means of Identification	16-242, 16-244, 16-245, 26-248, 26-248-1000, 26-248PC, 35-249FS, 36-241SO, 36-244APREXP, 36-244AX, 36-244AXEXP, 36-244C, 36-244CHR, 36-244CQ, 36-244E, 36-244FEDEXP, 36-244FS, 36-244PC, 36-244PM, 36-244PMEXP, 36-244PPEXP, 36-244PROFEXP, 36-244RAD, 36-244SO, 36-244SP, 36-244SPROEXP, 36-244STP, 36-244STPEXP, 36-244TH, 36-244TOT, 36-244U/N, 36-244UFA, 36-244UG, 36-245UFA, 36-249AXEXP, 36-249CHR, 36-249E, 36-249SPROEXP, 36-254SO, 86-244-PRO, 86-244SY, 86-249, 86-249-1000, BULK-16245, BULK-86245, BULK-TRUCK26429
Recommended Use	Please refer to Product label.
Restrictions on Use	None known.
Manufacturer / Supplier	Recochem Inc., 850 Montee de Liesse, Montreal, QC, H4T 1P4, Compliance and Regulatory Department, 905-878-5544, www.recochem.com
Emergency Phone No.	CANUTEC, 613-996-6666, 24 Hours
SDS No.	1552

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Acute toxicity (Oral) - Category 4; Reproductive Toxicity - Category 1B; Specific target organ toxicity (repeated exposure) - Category 2

GHS Label Elements

Signal Word:
Danger

Hazard Statement(s):

H302	Harmful if swallowed.
H360	May damage fertility or the unborn child.
H373	May cause damage to organs (kidneys) through prolonged or repeated exposure following skin contact and/or if swallowed.

Prevention:

P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P260	Do not breathe fume, mist, vapours, spray.
P264	Wash hands and skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Response:

P301 + P312 IF SWALLOWED: Call a POISON CENTRE/doctor if you feel unwell.
P330 Rinse mouth.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P314 Get medical advice/attention if you feel unwell.

Storage:

Store in a well ventilated place. Keep cool. Keep container tightly closed. Store locked up.

Disposal:

Dispose of contents/container in accordance with applicable regional, national and local laws and regulations.

Note:

0.1-1

% of the mixture consists of ingredient(s) of unknown acute toxicity.

Other Hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Mixture:

Chemical Name	CAS No.	%	Other Identifiers
Ethylene glycol	107-21-1	60-100	
Sodium Salt of Boron Acid	CBI*		

Notes

The specific chemical identity and/or exact percentage of composition (concentration) has been withheld as a trade secret.

SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

Remove source of exposure or move to fresh air. Call a Poison Centre or doctor if you feel unwell or are concerned.

Skin Contact

Take off contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Wash gently and thoroughly with lukewarm, gently flowing water and mild soap for 5 minutes. Call a Poison Centre or doctor if you feel unwell or are concerned. Clean clothing, shoes and leather goods.

Eye Contact

If eye irritation persists, get medical advice/attention. Immediately rinse the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open.

Ingestion

Rinse mouth with water. Call a Poison Centre or doctor if you feel unwell or are concerned.

Most Important Symptoms and Effects, Acute and Delayed

If swallowed: There are 3 stages of effects, which can overlap. Early symptoms can include upset stomach, slurred speech, clumsiness, drowsiness, and convulsions. Second stage symptoms can include rapid heartbeat and breathing, bluish lips and skin, fluid in the lungs and heart failure. In the last stage, there can be kidney stones and kidney damage with lower back pain, and increased then decreased urine production. There may be delayed nervous system effects such as paralysis of the face, clumsiness, impaired hearing and blurred vision. Death can occur at any stage.

Immediate Medical Attention and Special Treatment

Target Organs

Digestive system, nervous system, heart, digestive system, kidneys, skin.

Special Instructions

The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis, central nervous system depression and kidney injury. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia. Treatment with ethanol to inhibit the metabolism of glycol to oxalate.Early administration of ethanol may counter the toxic effects of ethylene glycol (cardiopulmonary effects attributed to metabolic acidosis and renal damage). Hemodialysis or peritoneal dialysis have been of benefit. Pre-existing respiratory and skin disorders may be aggravated by over-exposure to this product. Treat symptomatically and supportively.

Medical Conditions Aggravated by Exposure

Dermatitis.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Carbon dioxide, dry chemical powder or appropriate foam.

Unsuitable Extinguishing Media

None known.

Specific Hazards Arising from the Chemical

Can ignite if strongly heated.
In a fire, the following hazardous materials may be generated: irritating chemicals.

Special Protective Equipment and Precautions for Fire-fighters

Review Section 6 (Accidental Release Measures) for important information on responding to leaks/spills.
See Skin Protection in Section 8 (Exposure Controls/Personal Protection) for advice on suitable chemical protective materials.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

Use the personal protective equipment recommended in Section 8 of this safety data sheet.

Environmental Precautions

Do not allow into any sewer, on the ground or into any waterway.

Methods and Materials for Containment and Cleaning Up

Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any

other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Conditions for Safe Storage

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

	ACGIH TLV®		OSHA PEL		AIHA WEEL	
Chemical Name	**TWA**	**STEL**	**TWA**	**Ceiling**	**8-hr TWA**	**TWA**
Ethylene glycol	10 mg/m3	100 mg/m3	Not established	50 ppm		
Sodium Salt of Boron Acid	Not established	Not established	Not established	Not established		

Appropriate Engineering Controls

The hazard potential of this product is relatively low. General ventilation is usually adequate. Use local exhaust ventilation, if general ventilation is not adequate to control amount in the air.

Individual Protection Measures

Eye/Face Protection

Not required but it is good practice to wear safety glasses or chemical safety goggles.

Skin Protection

Wear chemical protective clothing e.g. gloves, aprons, boots.
Nitrile rubber.

Respiratory Protection

Not normally required if product is used as directed. For non-routine or emergency situations: wear a NIOSH approved air-purifying respirator with an appropriate cartridge.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties

Appearance	Clear green liquid.
Odour	Not available
Odour Threshold	Not available
pH	Not available
Melting Point/Freezing Point	-13 ºC (9 ºF) (Ethylene glycol) (melting); -13 ºC (9 ºF) (Ethylene glycol) (freezing)
Initial Boiling Point/Range	197 ºC (387 ºF)
Flash Point	111 ºC (232 ºF) (closed cup) (Ethylene glycol)
Evaporation Rate	< 0.01
Flammability (solid, gas)	Not applicable
Upper/Lower Flammability or Explosive Limit	21.6 - 22.0% (Ethylene glycol) (upper); 3.2% (Ethylene glycol) (lower)
Vapour Pressure	0.090 mm Hg (0.012 kPa) at 20 ºC (Ethylene glycol)
Vapour Density (air = 1)	2.14 (estimated)
Relative Density (water = 1)	1.12 - 1.15 at 20 ºC (Ethylene glycol)

Solubility	Not available in water; Soluble in all proportions in ketones (e.g. acetone).
Partition Coefficient, n-Octanol/Water (Log Kow)	-1.36 at 20 ºC (Ethylene glycol)
Auto-ignition Temperature	398 ºC (748 ºF) (Ethylene glycol)
Decomposition Temperature	Not available
Viscosity	18.86 mm2/s at 20 ºC (estimated) (kinematic); 21 mPa.s at 20 ºC (estimated) (dynamic)

Other Information

Physical State	Liquid
Molecular Weight	Not available

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Not reactive under normal conditions of use.

Chemical Stability

Normally stable.

Possibility of Hazardous Reactions

None known.

Conditions to Avoid

High temperatures. Open flames, sparks, static discharge, heat and other ignition sources. Temperatures above 111.0 ºC (231.8 ºF)

Incompatible Materials

Slightly reactive or incompatible with the following materials: oxidizing agents (e.g. peroxides), strong acids (e.g. hydrochloric acid), strong bases (e.g. sodium hydroxide).
Not corrosive to metals.

Hazardous Decomposition Products

Very toxic carbon monoxide, carbon dioxide.

SECTION 11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Skin contact; ingestion.

Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Ethylene glycol	2725 mg/m3 (rat) (4-hour exposure)	4700 mg/kg (rat)	9530 mg/kg (rabbit)
Sodium Salt of Boron Acid	Not available	Not available	Not available

LC50: Not applicable.

LD50 (oral): Not applicable.

LD50 (dermal): Not applicable.

Skin Corrosion/Irritation

May cause moderate or severe irritation based on information for closely related materials. Symptoms include pain, redness, and swelling.

Serious Eye Damage/Irritation

May cause serious eye irritation based on information for closely related materials. Symptoms include sore, red eyes, and tearing.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

At high concentrations vapour may cause lung injury, nose and throat irritation. Symptoms may include coughing, shortness of breath, difficult breathing and tightness in the chest. Symptoms may include headache, nausea, dizziness, drowsiness and confusion.

Skin Absorption

At high concentrations may cause Symptoms may include redness, rash, swelling and itching.

Ingestion

Toxic, can cause death based on information for closely related materials. depression of the central nervous system, and effects on the heart and kidneys. In some cases, there may be delayed effects on the nervous system. There are 3 stages of effects, which can overlap. Early symptoms can include upset stomach, slurred speech, clumsiness, drowsiness, and convulsions. Second stage symptoms can include rapid heartbeat and breathing, bluish lips and skin, fluid in the lungs and heart failure. In the last stage, there can be kidney stones and kidney damage with lower back pain, and increased then decreased urine production. There may be delayed nervous system effects such as paralysis of the face, clumsiness, impaired hearing and blurred vision. Death can occur at any stage.

Aspiration Hazard

Not known to be an aspiration hazard.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

May cause dermatitis. Symptoms may include dry, red, cracked skin (dermatitis).
May cause Following skin contact and/or if swallowed: harmful effects on the kidneys.

Respiratory and/or Skin Sensitization

Not known to be a respiratory sensitizer. Not known to be a skin sensitizer.

Carcinogenicity

Chemical Name	IARC	ACGIH®	NTP	OSHA
Ethylene glycol	Not Listed	A4	Not Listed	Not Listed
Sodium Salt of Boron Acid	Not Listed	A4	Not Listed	Not Listed

Reproductive Toxicity

Development of Offspring

If swallowed: at high concentrations animal studies show effects on the offspring. Known to cause: decreased weight. Embryotoxic (late resorptions) teratogenic(external, soft tissue and skeletal defects) may harm the unborn child. (Sodium Salt of Boron Acid)

Sexual Function and Fertility

May cause effects on sexual function and/or fertility. (Sodium Salt of Boron Acid)

Effects on or via Lactation

No information was located.

Germ Cell Mutagenicity

Not known to be a mutagen.

Interactive Effects

No information was located.

Other Information

TOXIC SUBSTANCE: KEEP AWAY FROM ANIMALS AND SMALL CHILDREN.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity

Acute Aquatic Toxicity

Chemical Name	LC50 Fish	EC50 Crustacea	ErC50 Aquatic Plants	ErC50 Algae
Ethylene glycol	18500 mg/L (Oncorhynchus mykiss (rainbow trout); 96-hour; fresh water)	74000 mg/L (Daphnia magna (water flea); 24 hr)		
Sodium Salt of Boron Acid	Not available	Not available		

Chronic Aquatic Toxicity

Chemical Name	NOEC Fish	EC50 Fish	NOEC Crustacea	EC50 Crustacea
Ethylene glycol	39140 mg/L (Oncorhynchus mykiss (rainbow trout))		24000 mg/L (Daphnia magna (water flea))	
Sodium Salt of Boron Acid	Not available	Not available		

Persistence and Degradability

No information was located.

Bioaccumulative Potential

This product and its degradation products are not expected to bioaccumulate.

Mobility in Soil

No information was located.

Other Adverse Effects

There is no information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14. TRANSPORT INFORMATION

Not regulated under Canadian TDG Regulations.

Regulation	UN No.	Proper Shipping Name	Transport Hazard Class(es)	Packing Group
US DOT	3082	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID (Ethylene glycol)	9	III

Environmental Hazards Not applicable (Ethylene glycol)

Special Precautions for User Please note: In single containers of 5000 lbs capacity or less this product is exempt from DOT regulations (non regulated). Does not require label or placards. Regulated Quantity (RQ)= 5000 lbs (2268 kg) (as ethylene glycol) For bulk shipments equal to or greater than Regulated Quantity (RQ), please adhere to classification as outlined in DOT Classification section.

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations

Canada

Domestic Substances List (DSL) / Non-Domestic Substances List (NDSL)

All ingredients are listed on the DSL/NDSL.

USA

Toxic Substances Control Act (TSCA) Section 8(b)

All ingredients are listed on the TSCA Inventory.

Additional USA Regulatory Lists

California Proposition 65:
WARNING: This product contains chemicals known to the State of California to cause birth defects.
WARNING: This product contains chemicals known to the State of California to cause Reproductive Toxicity.

SECTION 16. OTHER INFORMATION

SDS Prepared By	Compliance and Regulatory Department
Phone No.	905-878-5544
Date of Preparation	October 01, 2015
Additional Information	We are committed to uphold the Industry Consumer Ingredient Communication Voluntary Initiative. Please send us your request by visiting our website at www.recochem.com. Ingredients present (intentionally added ingredients) at a concentration of greater than one percent (1%) shall be listed in descending order of predominance. Ingredients present at a concentration of not more than one percent shall be listed but may be disclosed without respect to order of predominance.
Disclaimer	Notice to reader: To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

DIESEL FUEL

1 . Product and company identification

Product name : DIESEL FUEL

Synonym : Seasonal Diesel, #1 Diesel, #2 Heating Oil, #1 Heating Oil, D50, D60, P40, P50, Arctic Diesel, Farm Diesel, Marine Diesel, Low Sulphur Diesel, LSD, Ultra Low Sulphur Diesel, ULSD, Mining Diesel, Naval Distillate, Dyed Diesel, Marked Diesel, Coloured Diesel, Furnace special, Biodiesel blend, B1, B2, B5, Diesel Low Cloud (LC), Marine Gas Oil.

Code : W104, W293

Material uses : Diesel fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type. Mining diesels, marine diesels, MDO and naval distillates may have a higher flash point requirement.

Manufacturer : PETRO-CANADA
P.O. Box 2844
150 – 6th Avenue South-West
Calgary, Alberta
T2P 3E3

In case of emergency : Petro-Canada: 403-296-3000
Canutec Transportation: 613-996-6666
Poison Control Centre: Consult local telephone directory for emergency number(s).

2 . Hazards identification

Physical state : Bright oily liquid.

Odour : Mild petroleum oil like.

WHMIS (Canada) :

Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Emergency overview : WARNING!

COMBUSTIBLE LIQUID AND VAPOUR. CAUSES EYE AND SKIN IRRITATION.

Combustible liquid. Severely irritating to the skin. Irritating to eyes. Keep away from heat, sparks and flame. Do not get in eyes. Avoid breathing vapour or mist. Avoid contact with skin and clothing. Use only with adequate ventilation. Wash thoroughly after handling.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Inhalation : Inhalation of this product may cause respiratory tract irritation and Central Nervous System (CNS) Depression, symptoms of which may include; weakness, dizziness, slurred speech, drowsiness, unconsciousness and in cases of severe overexposure; coma and death.

Ingestion : Ingestion of this product may cause gastro-intestinal irritation. Aspiration of this product may result in severe irritation or burns to the respiratory tract.

Skin : Severely irritating to the skin.

Eyes : Irritating to eyes.

Potential chronic health effects

Chronic effects : No known significant effects or critical hazards.

Carcinogenicity : Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

2 . Hazards identification

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Medical conditions aggravated by over-exposure : Avoid prolonged or repeated skin contact to diesel fuels which can lead to dermal irritation and may be associated with an increased risk of skin cancer.

See toxicological information (Section 11)

3 . Composition/information on ingredients

Name	CAS number	%
Hydrotreated Renewable Diesel/ Fuels, diesel/ Fuel Oil No. 1/ Fuel Oil No. 2	64742-81-0/ 68334-30-5/ 8008-20-6/ 68476-30-2	95 - 100
Alkanes, C10 – 20 Branched and Linear (R100)	928771-01-1	10 - 20
Fatty acids methyl esters	61788-61-2 / 67784-80-9 / 73891-99-3	0 - 5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4 . First-aid measures

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5 . Fire-fighting measures

Flammability of the product : Combustible liquid

Extinguishing media

Suitable : Use dry chemical, CO_2, water spray (fog) or foam.

Not suitable : Do not use water jet.

Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Products of combustion : Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S), smoke and irritating vapours as products of incomplete combustion.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

5 . Fire-fighting measures

Special remarks on fire hazards : Flammable in presence of open flames, sparks and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite.

Special remarks on explosion hazards : Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Runoff to sewer may create fire or explosion hazard.

6 . Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7 . Handling and storage

Handling : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage : Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. Ensure the storage containers are grounded/bonded.

8 . Exposure controls/personal protection

Ingredient	Exposure limits
Fuels, diesel	**ACGIH TLV (United States). Absorbed through skin.** TWA: 100 mg/m³, (Inhalable fraction and vapour) 8 hour(s).
Fuel oil No. 2	**ACGIH TLV (United States). Absorbed through skin.** TWA: 100 mg/m³, (Inhalable fraction and vapour) 8 hour(s).
Hydrotreated Renewable Diesel	**ACGIH TLV (United States). Absorbed through skin.** TWA: 200 mg/m³ 8 hour(s).
Fuel oil No. 1	**ACGIH TLV (United States). Absorbed through skin.** TWA: 200 mg/m³ 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Recommended: nitrile, neoprene, polyvinyl alcohol (PVA), Viton®. Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9 . Physical and chemical properties

Physical state : Bright oily liquid.

Flash point : Diesel fuel and other distillate fuels: Closed cup: ≥40°C (≥104°F)
Marine Diesel/MDO/Naval Distillate: Closed Cup: ≥60°C (≥140°F)
Mining Diesel: Closed Cup: ≥52°C (≥126°F)

Auto-ignition temperature : 225°C (437°F)

Flammable limits : Lower: 0.7%
Upper: 6%

Colour : Clear to yellow (This product may be dyed red for taxation purposes).

Odour : Mild petroleum oil like.

Odour threshold : Not available.

pH : Not available.

Boiling/condensation point : 150 to 371°C (302 to 699.8°F)

Melting/freezing point : Not available.

Relative density : 0.80 to 0.88 kg/L @ 15°C (59°F)

Vapour pressure : 1 kPa (7.5 mm Hg) @ 20°C (68ºF).

Vapour density : 4.5 [Air = 1]

Volatility : Not available.

Evaporation rate : Not available.

Viscosity : Diesel fuel: 1.3 - 4.1 cSt @ 40°C (104°F)
Marine Diesel Fuel: 1.3 - 4.4 cSt @ 40°C (104°F)

Pour point : Not available.

Solubility : Insoluble in cold water, soluble in non-polar hydrocarbon solvents.

10 . Stability and reactivity

Chemical stability : The product is stable.

Hazardous polymerisation : Under normal conditions of storage and use, hazardous polymerisation will not occur.

Materials to avoid : Reactive with oxidising agents and acids.

Hazardous decomposition products : May release COx, NOx, SOx, H_2S, smoke and irritating vapours when heated to decomposition.

11 . Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Fuels, diesel	LD50 Dermal	Mouse	24500 mg/kg	-
	LD50 Oral	Rat	7500 mg/kg	-
Fuel oil No. 2	LD50 Oral	Rat	12000 mg/kg	-
Fuel oil No. 1	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
	LC50 Inhalation Vapour	Rat	>5000 mg/m³	4 hours
Hydrotreated Renewable Diesel	LD50 Dermal	Rabbit	>2000 mg/kg	-
	LD50 Oral	Rat	>5000 mg/kg	-
	LC50 Inhalation Vapour	Rat	>5200 mg/m³	4 hours

Conclusion/Summary : Not available.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

11 . Toxicological information

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Diesel engine exhaust particulate is probably carcinogenic to humans (IARC Group 2A).

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
Fuels, diesel	A3	3	-	-	-	-
Fuel oil No. 1	A3	3	-	-	-	-
Fuel oil No. 2	A3	3	-	-	-	-
Hydrotreated Renewable Diesel	A3	3	-	-	-	-

Mutagenicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Conclusion/Summary : Not available.

Biodegradability

Conclusion/Summary : Not available.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14 . Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
TDG Classification	UN1202	DIESEL FUEL	3	III		-
DOT Classification	Not available.	Not available.	Not available.	-		-

14 . Transport information

PG* : Packing group

15 . Regulatory information

United States

HCS Classification : Combustible liquid
Irritating material

Canada

WHMIS (Canada) : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

Canada inventory : All components are listed or exempted.

United States inventory (TSCA 8b) : All components are listed or exempted.

Europe inventory : All components are listed or exempted.

16 . Other information

Label requirements : COMBUSTIBLE LIQUID AND VAPOUR. CAUSES EYE AND SKIN IRRITATION.

Hazardous Material Information System (U.S.A.) :

Health	2
Flammability	2
Physical hazards	0
Personal protection	H

National Fire Protection Association (U.S.A.) :

References : Available upon request.
™ Trademark of Suncor Energy Inc. Used under licence.

Date of printing : **4/14/2014.**

Date of issue : 28 June 2013

Date of previous issue : No previous validation.

Responsible name : **Product Safety - DSR**

Indicates information that has changed from previously issued version.

For Copy of (M)SDS : Internet: www.petro-canada.ca/msds

Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228

For Product Safety Information: (905) 804-4752

Notice to reader

16 . Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	GASOLINE, UNLEADED
Synonyms	:	Regular, Unleaded Gasoline (US Grade), Mid-Grade, Plus, Super, WinterGas, SummerGas, Supreme, SuperClean, SuperClean WinterGas, RegularClean, PlusClean, Premium, marked or dyed gasoline, TQRUL, transitional quality regular unleaded, BOB, Blendstock for Oxygenate Blending, Conventional Gasoline, RUL, MUL, SUL, PUL.
Product code	:	100126, 101823, 100507, 101811, 101814, 100141, 101813, 101810, 101812, 100063, 101822, 100138, 101821, 100064, 101820, 101819, 100506, 101818, 101816, 101817, 100488

Manufacturer or supplier's details

Petro-Canada
P.O. Box 2844, 150 - 6th Avenue South-West
Calgary Alberta T2P 3E3
Canada

Emergency telephone number		Suncor Energy: +1 403-296-3000; Poison Control Centre: Consult local telephone directory for emergency number(s).

Recommended use of the chemical and restrictions on use

Recommended use	:	Unleaded gasoline is used in spark ignition engines including motor vehicles, inboard and outboard boat engines, small engines such as chain saws and lawn mowers, and recreational vehicles.
Prepared by	:	Product Safety: +1 905-804-4752

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	Clear liquid.
Colour	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	Gasoline
Hazard Summary	Flammable liquid Irritating to eyes and skin. May cause cancer. May cause heritable genetic damage.

Potential Health Effects

Primary Routes of Entry : Eye contact

		Ingestion Inhalation Skin contact
Target Organs	:	Blood Immune system
Inhalation	:	Inhalation may cause central nervous system effects. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness.
Skin	:	May irritate skin.
Eyes	:	May irritate eyes.
Ingestion	:	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Aspiration hazard if swallowed - can enter lungs and cause damage.
Chronic Exposure	:	Chronic exposure to benzene may result in increased risk of leukemia and other blood disorders.
Aggravated Medical Condition	:	None known.

Carcinogenicity:

IARC	Group 1: Carcinogenic to humans	
	Benzene	71-43-2
ACGIH	Confirmed human carcinogen	
	Benzene	71-43-2
	Confirmed animal carcinogen with unknown relevance to humans	
	Ethanol	64-17-5
	Gasoline, natural	8006-61-9

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical Name	CAS-No.	Concentration (%)

gasoline	86290-81-5	95 - 100 %
toluene	108-88-3	1 - 40 %
benzene	71-43-2	0.5 - 1.5 %
ethanol	64-17-5	0.1 - 0.3 %

SECTION 4. FIRST AID MEASURES

If inhaled	:	Artificial respiration and/or oxygen may be necessary. Move to fresh air. Seek medical advice.
In case of skin contact	:	In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Wash clothing before reuse. Seek medical advice.
In case of eye contact	:	Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
If swallowed	:	Rinse mouth with water. DO NOT induce vomiting unless directed to do so by a physician or poison control center. Never give anything by mouth to an unconscious person. Seek medical advice.
Most important symptoms and effects, both acute and delayed	:	First aider needs to protect himself.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Dry chemical Carbon dioxide (CO2) Water fog. Foam
Unsuitable extinguishing media	:	Do NOT use water jet.
Specific hazards during firefighting	:	Cool closed containers exposed to fire with water spray.
Hazardous combustion products	:	Carbon oxides (CO, CO2), nitrogen oxides (NOx), polynuclear aromatic hydrocarbons, phenols, aldehydes, ketones, smoke and irritating vapours as products of incomplete combustion.

Further information	:	Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Ensure adequate ventilation. Evacuate personnel to safe areas. Material can create slippery conditions.
Environmental precautions	:	If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Prevent further leakage or spillage if safe to do so. Remove all sources of ignition. Soak up with inert absorbent material. Non-sparking tools should be used. Ensure adequate ventilation. Contact the proper local authorities.

SECTION 7. HANDLING AND STORAGE

Advice on safe handling	:	For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Use only with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Avoid contact with skin, eyes and clothing. Do not ingest. Keep away from heat and sources of ignition. Keep container closed when not in use.
Conditions for safe storage	:	Store in original container. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in a dry, cool and well-ventilated place. Keep in properly labelled containers. To maintain product quality, do not store in heat or direct sunlight.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis

gasoline	86290-81-5	TWA	300 ppm	CA AB OEL
		STEL	500 ppm	CA AB OEL
		TWA	300 ppm	CA BC OEL
		STEL	500 ppm	CA BC OEL
		TWA	300 ppm	ACGIH
		STEL	500 ppm	ACGIH
toluene	108-88-3	TWA	50 ppm 188 mg/m3	CA AB OEL
		TWA	20 ppm	CA BC OEL
		TWAEV	50 ppm 188 mg/m3	CA QC OEL
		TWA	20 ppm	ACGIH
benzene	71-43-2	TWA	0.5 ppm 1.6 mg/m3	CA AB OEL
		STEL	2.5 ppm 8 mg/m3	CA AB OEL
		TWA	0.5 ppm	CA BC OEL
		STEL	2.5 ppm	CA BC OEL
		TWA	0.5 ppm	CA ON OEL
		STEL	2.5 ppm	CA ON OEL
		TWAEV	1 ppm 3 mg/m3	CA QC OEL
		STEV	5 ppm 15.5 mg/m3	CA QC OEL
		TWA	0.5 ppm	ACGIH
		STEL	2.5 ppm	ACGIH
ethanol	64-17-5	TWA	1,000 ppm 1,880 mg/m3	CA AB OEL
		STEL	1,000 ppm	CA BC OEL
		TWAEV	1,000 ppm 1,880 mg/m3	CA QC OEL
		STEL	1,000 ppm	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Toluene	108-88-3	Toluene	In blood	Prior to last shift of workweek	0.02 mg/l	ACGIH BEI
		Toluene	Urine	End of shift (As soon as possible after exposure ceases)	0.03 mg/l	ACGIH BEI

Engineering measures : Use only in well-ventilated areas.
Ensure that eyewash station and safety shower are proximal to the work-station location.

Personal protective equipment

Respiratory protection	:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Filter type	:	A NIOSH-approved air-purifying respirator with an organic vapour cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air-purifying respirators is limited. Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstances where air-purifying respirators may not provide adequate protection.
Hand protection		
Material	:	polyvinyl alcohol (PVA), Viton(R). Consult your PPE provider for breakthrough times and the specific glove that is best for you based on your use patterns. It should be realized that eventually any material regardless of their imperviousness, will get permeated by chemicals. Therefore, protective gloves should be regularly checked for wear and tear. At the first signs of hardening and cracks, they should be changed.
Remarks	:	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eye protection	:	Wear face-shield and protective suit for abnormal processing problems.
Skin and body protection	:	Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Protective measures	:	Wash contaminated clothing before re-use.
Hygiene measures	:	Remove and wash contaminated clothing and gloves, including the inside, before re-use. Wash face, hands and any exposed skin thoroughly after handling.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Clear liquid.
Colour	:	Clear to slightly yellow or green, undyed liquid. May be dyed red for taxation purposes.
Odour	:	Gasoline
Odour Threshold	:	No data available

pH	:	No data available
Pour point	:	No data available
Boiling point/boiling range	:	25 - 225 °C (77 - 437 °F)
Flash point	:	-50 - -38 °C (-58 - -36 °F) Method: Tagliabue.
Auto-Ignition Temperature	:	257 °C (495 °F)
Evaporation rate	:	No data available
Flammability	:	Extremely flammable in presence of open flames, sparks, shocks, and heat. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. Rapid escape of vapour may generate static charge causing ignition. May accumulate in confined spaces.
Upper explosion limit	:	7.6 %(V)
Lower explosion limit	:	1.3 %(V)
Vapour pressure	:	< 802.5 mmHg (20 °C / 68 °F)
Relative vapour density	:	3
Relative density	:	0.685 - 0.8
Solubility(ies)		
Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	No data available
Viscosity		
Explosive properties	:	Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Containers may explode in heat of fire. Vapours may form explosive mixtures with air.

SECTION 10. STABILITY AND REACTIVITY

Possibility of hazardous reactions	:	Hazardous polymerisation does not occur. Stable under normal conditions.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Reactive with oxidising agents, acids and interhalogens.
Hazardous decomposition products	:	May release COx, NOx, phenols, polycyclic aromatic hydrocarbons, aldehydes, ketones, smoke and irritating vapours when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure : Eye contact
Ingestion
Inhalation
Skin contact

Acute toxicity

Product:

Acute oral toxicity : Remarks: No data available

Acute inhalation toxicity : Remarks: No data available

Acute dermal toxicity : Remarks: No data available

Components:

gasoline:

Acute oral toxicity : LD50 Rat: 13,600 mg/kg,

Acute dermal toxicity : LD50 Rabbit: > 5,000 mg/kg,

toluene:

Acute oral toxicity : LD50 Rat: 5,580 mg/kg,

Acute inhalation toxicity : LC50 Rat: 7585 ppm
Exposure time: 4 h
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 Rabbit: 12,125 mg/kg,

benzene:

Acute oral toxicity : LD50 Rat: 2,990 mg/kg,

Acute inhalation toxicity : LC50 Rat: 13700 ppm
Exposure time: 4 h
Test atmosphere: dust/mist

Acute dermal toxicity : LD50 Rabbit: > 8,240 mg/kg,

ethanol:

Acute oral toxicity : LD50 Rat: 7,060 mg/kg,

Acute inhalation toxicity : LC50 Rat: > 32380 ppm
Exposure time: 4 h
Test atmosphere: vapour

Skin corrosion/irritation

Product:

Remarks: No data available

Components:

gasoline:
Result: Moderate skin irritant

toluene:
Result: Moderate skin irritant

benzene:
Result: Moderate skin irritant

ethanol:
Result: Skin irritation

Serious eye damage/eye irritation

Product:

Remarks: No data available

Components:

gasoline:
Result: Mild eye irritation

toluene:
Result: Mild eye irritation

benzene:
Result: Moderate eye irritation

ethanol:
Result: Eye irritation

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Aspiration toxicity

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish	:	Remarks: No data available
Toxicity to daphnia and other aquatic invertebrates	:	Remarks: No data available
Toxicity to algae	:	Remarks: No data available
Toxicity to bacteria	:	Remarks: No data available

Persistence and degradability

Product:

Biodegradability	:	Remarks: No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	The product should not be allowed to enter drains, water courses or the soil. Offer surplus and non-recyclable solutions to a licensed disposal company. Waste must be classified and labelled prior to recycling or disposal. Send to a licensed waste management company. Dispose of as hazardous waste in compliance with local and national regulations. Dispose of product residue in accordance with the instructions of the person responsible for waste disposal.
Contaminated packaging	:	Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulation

IATA-DGR

UN/ID No.	:	1203
Proper shipping name	:	Gasoline
Class	:	3
Packing group	:	II
Labels	:	3
Packing instruction (cargo aircraft)	:	364

IMDG-Code

UN number	:	1203
Proper shipping name	:	GASOLINE
Class	:	3
Packing group	:	II
Labels	:	3
EmS Code	:	F-E, S-E
Marine pollutant	:	no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

TDG

UN number	:	1203
Proper shipping name	:	GASOLINE
Class	:	3
Packing group	:	II
Labels	:	3
ERG Code	:	128
Marine pollutant	:	no

Special precautions for user

Not applicable

SECTION 15. REGULATORY INFORMATION

WHMIS Classification : B2: Flammable liquid
D2A: Very Toxic Material Causing Other Toxic Effects
D2B: Toxic Material Causing Other Toxic Effects

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

The components of this product are reported in the following inventories:

DSL	On the inventory, or in compliance with the inventory
TSCA	All chemical substances in this product are either listed on the TSCA Inventory or are in compliance with a TSCA Inventory exemption.
EINECS	On the inventory, or in compliance with the inventory

SECTION 16. OTHER INFORMATION

For Copy of (M)SDS	:	Internet: www.petro-canada.ca/msds Canada-wide: telephone: 1-800-668-0220; fax: 1-800-837-1228 For Product Safety Information: 1 905-804-4752
Prepared by	:	Product Safety: +1 905-804-4752

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

APPENDIX D-3

NT-NU SPILL REPORT FORM

Appendix A
Schedule 1 – Reportable Quantities for NT–NU Spills

Substance	Reportable Quantity	TDG Class
Explosives	Any amount	1.0
Compressed gas (toxic/corrosive)		2.3/2.4
Infectious substances		6.2
Sewage and wastewater (unless otherwise authorized)		6.2
Radioactive materials		7.0
Unknown substance		None
Compressed gas (Flammable)	Any amount of gas from containers with a capacity greater than 100 L	2.1
Compressed gas (Non-corrosive, non-flammable)		2.2
Flammable liquid	≥ 100 L	3.1/3.2/3.3
Flammable solid	≥ 25 kg	4.1
Substances liable to spontaneous combustion		4.2
Water reactant substances		4.3
Oxidizing substances	≥ 50 L or 50 kg	5.1
Organic peroxides	≥ 1 L or 1 kg	5.2
Environmentally hazardous substances intended for disposal		9.0
Toxic substances	≥ 5 L or 5 kg	6.1
Corrosive substances		8.0
Miscellaneous products, substances or organisms		9.0
PCB mixtures of 5 or more parts per million	≥ 0.5 L or 0.5 kg	9.0
Other contaminants, e.g. crude oil, drilling fluid, produced water, waste or spent chemicals, used or waste oil, vehicle fluids, wastewater, etc.	≥ 100 L or 100 kg	None
Sour natural gas (i.e., contains H_2S)	Uncontrolled release or sustained flow of 10 minutes or more	None
Sweet natural gas		
Flammable liquid	≥ 20 L	3.1/3.2/3.3
Vehicle fluids	When released on a frozen water body that is being used as a working surface	None
Reported releases or potential releases of any size that: 1. Are near or in an open water body; 2. Are near or in a designated sensitive environment or habitat; 3. Pose an imminent threat to human health or safety; or 4. Pose an imminent threat to a listed species at risk or its critical habitat	Any amount	None

Note: L = litre; kg = kilogram; PCB = Polychlorinated Biphenyls; ppm = parts per million

Appendix C

Instructions for Completing the NT-NU Spill Report Form

Spill reports to be phoned in immediately by calling collect at 867-920-8130. The NT/NU Spill Report Form can be filled out electronically and faxed to the Spill Report Line* at 867-873-6924. Forms can also be emailed as an attachment to spills@gov.nt.ca. Please verify receipt of email transmissions with a follow-up telephone call to 867-920-8130.

A. Report Date and Time	The actual date and time that the spill was reported to the Spill Report Line. If the spill is phoned in, the Spill Report Line will fill this out. Please do not fill in the Report Number. The Spill Report Line will assign a report number after the spill is reported.
B. Occurrence Date and Time	Indicate to the best of your knowledge the exact date and time that the spill occurred. This should not to be confused with the report date and time (Refer to Box A).
C. Land Use Permit Number and/or Water Licence Number	Fill this in only if a Land Use Permit and/or Water Licence has been issued.
D. Geographic Place Name	In most cases, this will be the name of the city or town where the spill occurred. For remote locations outside of communities, identify the most prominent geographic feature such as a named lake or mountain and/or the distance and direction from the nearest population centre. Please include the geographic coordinates for remote locations (Refer to Box E).
E. Geographic Coordinates	Only fill this out if the spill occurred outside of an established community (e.g. at a remote camp, mine site, road, highway or shipping route). State the location in degrees, minutes and seconds of Latitude and Longitude (e.g. 64°29′46″N; 110°16′24″W, where N = North Latitude and W = West Longitude).
F. Responsible Party or Ship/Vessel/Barge Name	The Responsible Party is the person who managed, controlled or owned the product when it spilled. For a spill from a ship/vessel/barge, record the ship/vessel/barge name, normally painted on one or more sides. Provide the full address, telephone number and email of the responsible party or the ship/vessel/barge operator, if known. Use box K if there is insufficient space. Product owners are responsible for product spills, regardless of who or what may have actually caused a spill.
G. Any Contractor Involved	Record the name and address/office location of any other parties or contractors involved with the spill (e.g. a construction company working for the owner of the spilled product and who may have contributed to or caused the spill and/or is responding to the spill on behalf of the owner).
H. Product Spilled	Identify the product spilled. Most commonly, it is gasoline, diesel fuel or sewage. Avoid using trade names for spilled products. Wherever possible, use the chemical name of the product and further identify the product using the four-digit UN number (e.g. UN1203 for Gasoline, UN1202 for Diesel Fuel and UN1863 for Jet A & Jet B fuel). URL www.en.wikipedia.org/wiki/List_of_UN_numbers
I. Spill Source	Identify the source of the spill, if known (e.g. ship/vessel/barge, storage tank, pipeline, truck, sewage lagoon, tailings pond, etc.) and the cause of the spill, if known (e.g. overfill, leak, rupture, grounding, collision, fire, flood, extreme weather, corrosion, equipment failure, human error, vandalism, etc.). Provide an estimate of the extent of the contaminated area (e.g. 10 m^2 or 10 square metres).
J. Factors Affecting Spill	Identify factors that could make it difficult to control or clean up the spill (e.g. terrain, weather, access, visibility, dangerous work conditions, lack of equipment or personnel, ice, currents, tides etc.). Indicate if you require advice and/or assistance with the cleanup operation. Identify any hazards to persons, property or the environment.
K. Additional Information	Provide additional explanatory information and pertinent details about the spill (e.g. unusual hazards, properties or behaviour of the spilled product; a diagram of the spill site and affected areas; actions taken to contain, clean up and dispose of spilled material and notify affected parties; and problems or issues associated with the spill response). If necessary, append additional sheets to the spill report. Number the pages in the same format found in the lower right hand corner of the Spill Report Form (e.g. 'Page 1 of 2', 'Page 2 of 2', etc.). Please number the pages so recipients can determine if they received all pages.
L. Reported to Spill Report Line by	Provide your full name, employer, contact number and the location from which you are reporting the spill. Use box K if there is insufficient space.
M. Alternate Contact	Identify any alternate contacts. This information helps regulatory agencies obtain additional information if they are unable to contact the individual who reported the spill.
N. Spill Report Line Use Only	Leave blank. This box is for the Spill Report Line's use only.

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
Tel: (867) 920-8130 • Fax: (867) 873-6924 • Email: spills@gov.nt.ca

REPORT LINE USE ONLY

A	Report Date: MM DD YY	Report Time:	☐ Original Spill Report **OR** ☐ Update # to the Original Spill Report	**Report Number:**
B	Occurrence Date: MM DD YY	Occurrence Time:		
C	Land Use Permit Number (if applicable):		Water Licence Number (if applicable):	
D	Geographic Place Name or Distance and Direction from the Named Location:		Region: ☐ NT ☐ Nunavut ☐ Adjacent Jurisdiction or Ocean	
E	Latitude: _____ Degrees _____ Minutes _____ Seconds		Longitude: _____ Degrees _____ Minutes _____ Seconds	
F	Responsible Party or Vessel Name:	Responsible Party Address or Office Location:		
G	Any Contractor Involved:	Contractor Address or Office Location:		
H	Product Spilled: ☐ Potential Spill	Quantity in Litres, Kilograms or Cubic Metres:	U.N. Number:	
I	Spill Source:	Spill Cause:	Area of Contamination in Square Metres:	
J	Factors Affecting Spill or Recovery:	Describe Any Assistance Required:	Hazards to Persons, Property or Environment:	
K	Additional Information, Comments, Actions Proposed or Taken to Contain, Recover or Dispose of Spilled Product and Contaminated Materials:			

L	Reported to Spill Line by:	Position:	Employer:	Location Calling From:	Telephone:
M	Any Alternate Contact:	Position:	Employer:	Alternate Contact Location:	Alternate Telephone:

REPORT LINE USE ONLY

N	Received at Spill Line by:	Position:	Employer:	Location Called:	Report Line Number:

Lead Agency: ☐ EC ☐ CCG/TCMSS ☐ GNWT ☐ GN ☐ ILA ☐ AANDC ☐ NEB ☐ Other: _____

Significance: ☐ Minor ☐ Major ☐ Unknown

File Status: ☐ Open ☐ Closed

Agency:	**Contact Name:**	**Contact Name:**	**Remarks:**
Lead Agency:			
First Support Agency:			
Second Support Agency:			
Third Support Agency:			

DÉCLARATION DE DÉVERSEMENT AUX TNO ET AU NUNAVUT

PÉTROLE, ESSENCE, PRODUITS CHIMIQUES ET AUTRES MATIÈRES DANGEREUSES

Territoires du Nord-Ouest · Nunavut · Canada · Inuvialuit Land Administration

LIGNE TÉLÉPHONIQUE SOS DÉVERSEMENT DES TNO ET DU NUNAVUT
Tél. : 867-920-8130 ● Téléc. : 867-873-6924 ● Courriel : spills@gov.nt.ca

À L'USAGE DE SOS DÉVERSEMENT SEULEMENT

A	Date de la déclaration : AA MM JJ	Heure de la déclaration :	☐ Déclaration de déversement original **Ou** ☐ Mise à jour de la déclaration nº	**Numéro de la déclaration :**
B	Date de l'incident : AA MM JJ	Heure de l'incident :		
C	Nº de permis d'utilisation des terres (s'il y a lieu) :	Nº de permis d'utilisation des eaux (s'il y a lieu) :		
D	Nom du lieu géographique ou distance et direction d'un lieu nommé :	Région : ☐ TNO ☐ Nunavut ☐ Océan, province ou territoire adjacent		
E	Latitude : _____ Degrés _____ Minutes _____ Secondes	Longitude : _____ Degrés _____ Minutes _____ Secondes		
F	Partie responsable ou nom du navire :	Adresse ou emplacement du bureau de la partie responsable :		
G	Entrepreneur impliqué (s'il y a lieu) :	Adresse ou emplacement du bureau de l'entrepreneur :		
H	Type de contaminant : ☐ Déversement potentiel	Quantité en litres, en kilogrammes ou en mètres cubes :	Nº ONU :	
I	Source du déversement :	Cause du déversement :	Superficie contaminée en mètres carrés :	
J	Facteurs qui influent sur le déversement ou sur la réhabilitation du site :	Description de l'aide requise :	Risques pour les gens, les biens ou l'environnement :	
K	Renseignements, commentaires ou mesures proposées ou prises qui ont permis de contenir, de récupérer ou d'éliminer le contaminant déversé et les matières contaminées :			

L	Le signalement fait par :	Poste :	Employeur :	Provenance de l'appel :	Téléphone :
M	Autre personne-ressource :	Poste :	Employeur :	Lieu où se trouve la personne-ressource :	Téléphone :

À L'USAGE DE SOS DÉVERSEMENT SEULEMENT

N	Le signalement reçu par :	Poste :	Employeur :	Nom de la collectivité :	Nº de tél. de sos déversment :

Organisme responsable : ☐ EC ☐ CCG/TCMSS ☐ GNWT ☐ GN ☐ ILA ☐ AANDC ☐ NEB ☐ Autre : _____	Importance : ☐ Mineure ☐ Majeure ☐ Inconnue	État du dossier : ☐ Ouvert ☐ Fermé

Organisme :	**Personne-ressource :**	**Heure du signalement :**	**Commentaires :**
Organisme responsable :			
Organisme de soutien de première ligne :			
Organisme de soutien de deuxième ligne :			
Organisme de soutien de troisième ligne:			