Colville Lake Spill Plan November 2024 Conformity Table		
Board Direction	Document Reference	Detail of the Change
Add a Spill Response Flowchart at the beginning of section 4.1 with the most useful/common spill containment methods incorporated in the flowchart (as per the Guidelines).	Page 3, Section 4.0 Potential Spill Scenarios	Requested Chart added.
Provide details of spill kit as section 4.2 of the SCP.	Page 4 and 5 Section 7.0 Resource Inventory	List of Resources
Reinstate the amount and location of stored fuel	Section 3.0, Paragraph under Table 1	Potential fuel amounts and storage locations described.

Suite 4700, 888 3rd Street SW
Calgary, Alberta, Canada
T2P 5C5
www.paramountres.com

Spill Response Plan
Sahtu Settlement Region
Colville Lake Well Abandonment Program

November 2024

Contents

1.0 Company Background 1
2.0 Project Background 1
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Appendix D: Mackenzie Spill Response Corporation Container
Appendix E: Corporate Health, Safety & Environment Policy

1.0 Company Background

MGM Energy (MGM) is a wholly owned subsidiary of Paramount Resources Ltd (Paramount). Paramount is a leading, independent Canadian energy company that is focused on responsibly developing its world-class portfolio of diverse resource plays while consistently building value for shareholders. Paramount explores for, develops, produces and markets natural gas, oil and natural gas liquids in Alberta, British Columbia, Saskatchewan and the Northwest Territories.

Operating in Canada since 1976, Paramount's combination of focused approach, technical expertise and financial depth has propelled the Company into one of the top exploration and production firms in Canada. With daily production now nearing 100,000 Boe/d since the acquisition of Apache Canada Ltd. and merger with Trilogy Energy Corp.

MGM Energy holds mineral tenure in both the Inuvialuit Settlement Region (ISR) and the Sahtu Settlement Region (SSR). MGM Energy through exploration activities and corporate transactions has an ownership stake in a number of Significant Discovery Licences in both the ISR and SSR. Additionally, MGM Energy is the registered operator of a number surface locations in both the ISR and SSR.

2.0 Project Background

MGM is the operator of the Colville Lake area wells and associated surface and mineral holdings. The wells were drilled in the early 2000's and MGM is moving forward with plans to abandon the wells. The original the oil and gas activity in the area was conducted by Paramount and Apache Canada Ltd ("ACL"). In 2007 the Colville Lake Assets owned by Paramount along with other North of 60 Oil and Gas assets were spun off into MGM.

In 2014, Paramount reacquired MGM as a wholly owned subsidiary. Up until the fall of 2017 MGM held mineral rights with its partner ACL in the Colville Lake area under several Exploration Licences some of which were converted to Significant Discovery Licences and a freehold lease. In the fall of 2017 Paramount"acquired ACL., this acquisition of ACL in 2017 has made MGM the holder of the Licences, surface access and other regulatory approvals related to the Colville Lake area. Colville Lake has three areas: Maunoir, Nogha and Turton Lake.

Over the last 15 years MGM has been monitoring the wellbores along with reclamation and remediation activities at the surface locations, all of which has been helicopter based work. MGM is proposing to carry out the abandonment of the six wells between 2024 and 2026. It is the intention of MGM to abandon all of the wells in one activity year, however that is dependent on weather. Monitoring is expected to occur annually until closure. All abandonment activities, apart from mobilization/demobilization of barges, will occur during the winter season.

The following Program activities will be carried out during years with abandonment activities:

- Barge Mobilization (if required): July to October

- Ice road/ice pad construction and Maintenance: November to March
- Abandonment and reclamation activities: December to March
- Demobilization (ice roads): when ice road conditions are no longer safe for travel (approximately late March)
- Demobilization (barges, (if required): after spring break-up (approximately early July)

In subsequent years the sites will be accessed via helicopter for monitoring activities and remedial reclamation work (if required) until closure.

3.0 Project Location

The Program's wells are located within the K'asho Got'ine district of the Sahtu Settlement Region (SSR). Detailed site and access maps along with an overview map can be found in Appendix A.

Distances from the locations to the nearest communities is outlined in Table 1 below.

Table 1: Project Locations

Areas	**Locations**	**Well Statuses**	**Distance and Direction from Colville Lake**
Maunoir	L-80, C-34, E-35 and A-67	L-80: Abandoned C-34: Suspended E-35: Suspended A-67: Abandoned	Approximately 75 km to the northeast
Nogha	M-17, B-23, C-49, E-44 and K-14	M-17: Suspended B-23: Suspended C-49: Suspended E-44: not drilled K-14: Suspended	Approximately 90 km to the south

Fuel will be stored at the locations where work is occurring, this includes all of the well locations referenced in the above table. The other location where fuel could be stored is the Campsite west of M-17 in the Nogha area and at the camp location south of Lake 6 adjacent to the access road. Fuel will only be stored during times of activity and will be demobilized from the project area at the end of activity. It is anticipated that a 25,000 liter diesel tank and 10,000 liter gasoline tank will be stored in the project area during activity.

4.0 Potential Spill Scenarios

Potential spill scenarios during abandonment, reclamation and construction operations usually involve snow covered conditions and include:

- fuel storage tank failure;
- fuel transport vehicle rollover;
- water storage tank failure;
- water transport vehicle rollover;
- fluid tank failure;
- cement slurry returns;
- dry bulk cement and additives;
- radiator fluid from rig and vehicular traffic;
- oil changes and rig maintenance;
- camp related spills including sewage and grey water;
- anti-freeze fluid and hydraulic fluid spills.

Potential Spill	**Primary Preventive Measure(s)**	**Secondary Preventive Measure(s)**	**Primary Response(s)**	**Secondary Response(s)and Follow up**
Vehicle Spill	Proper maintenance and repair of any identified or known issues. Following proper procedures for refueling.	Drip Trays	Use of spill kits with the vehicle or staged nearby.	Hydrovac trucks and heavy equipment to remove materials
Tank Failure	Double wall tanks, proper maintenance and inspections. High level shutdowns in place (as required) and operable.	Berms	Use of spill kits on site.	Hydrovac trucks and heavy equipment to remove impacted materials
Camp Related Spills	Proper maintenance and repair of any identified or known issues. Following proper procedures for waste storage	Berms	Use of spill kits on site.	Hydrovac trucks and heavy equipment to remove impacted materials
Rig related spills	Proper maintenance and repair of any identified or known issues. Following proper procedures for operations	Berms	Use of spill kits on site.	Hydrovac trucks and heavy equipment to remove impacted materials

All of these scenarios normally are confined to land and will be mitigated by dikes and berms constructed and designed to contain foreseeable spills around any tankage and the peripheral of the well sites. Additionally, vehicles will have drip trays when they are idling for longer period of times and/or parked.

The MSDS sheets for the chemicals and fluids that could potentially be on site(s) can be found in Appendix B. Paramount on behalf of MGM has developed an Emergency Response Plan, including Emergency Response Procedures which can be found in Appendix C

5.0 Staging Areas

Appendix A of this plan contains a map of the Project area that outline the access and well sites. Additionally, well site surveys are included in Appendix A. Equipment will be staged on the locations in which work is being conducted. Back up equipment, if required, would be mobilized from the spill co-op locations in Norman Wells and/or from Colville Lake and staged at a location in close proximity to the location with the spill.

6.0 Training and Exercises

Paramount routinely trains its staff on various types of emergency situations. Spill response is incorporated into these scenarios. Paramount currently has a training schedule of mock emergency situations for its Alberta and British Columbia based operations and if the Northwest Territories becomes operational, this schedule will be modified to include the Northwest Territories operations. Currently, Paramount performs tabletop or logistics exercises once per year and full mock exercises for all critical (sour or environmentally sensitive) areas. Ongoing maintenance to all Emergency Response Plan and Hazardous Material Spill Contingency Plan components is conducted on an annual basis Additionally, MGM will conduct orientation and training with contractors prior to the commencement of the abandonment program. Lastly, through its membership to the Mackenzie Delta Spill Response Corporation MGM supports regional training initiatives.

7.0 Resource Inventory

The following is a list of manpower usually available on-site during abandonment and construction activities.

ON-SITE MANPOWER

- The on-scene commander is Paramount's Construction or Completions (abandonment and suspension operations) Supervisor
- Construction crews consist of equipment operators

- Rig crews Medical Attendant
- Camp Staff and attendants
- Ancillary service personnel on standby (including truck drivers)
- Water Truck Driver
- Vacuum Truck Operator
- Wildlife and Environmental Monitors
- Environmental Consultants

EQUIPMENT RESOURCES

MGM is a member of the Mackenzie Delta Spill Response Corporation and has access to all the resources stored in the SSR. The equipment that MGM would have on site and available to it via the Mackenzie Delta Spill Corporation is demonstrated by the current inventory list in Appendix D. MGM expects to stage one or two of the units within the project area during winter road/ice pad and abandonment activities. Currently, there are thirteen units in the SSR containing spill response resources. Additional information on the spill corporation and the resources MGM has access to via its membership can be found at http://www.mackenziespillresponse.ca/home.html . Additional onsite site-specific spill resources would include:

With Heavy Equipment

10 - 16" X 18" General purpose pads

2 - 3"X4' General purpose socks

1 – 6MIL Disposal bag

1 – Nitrile protective gloves

1 – CONTENTS LIST

With Service Rig

1 50 gallon over pack

1 4 oz. epoxy stick

9 Universal general purpose absorbent socks (3" X 48")

1 Oil select boom (5" X 10')

75 universal absorbent pads

8 Waste bags with hazmat labels and closures

1 Ground sheet (10’ X 10’)

1 Drain Cover (48” X 48”)

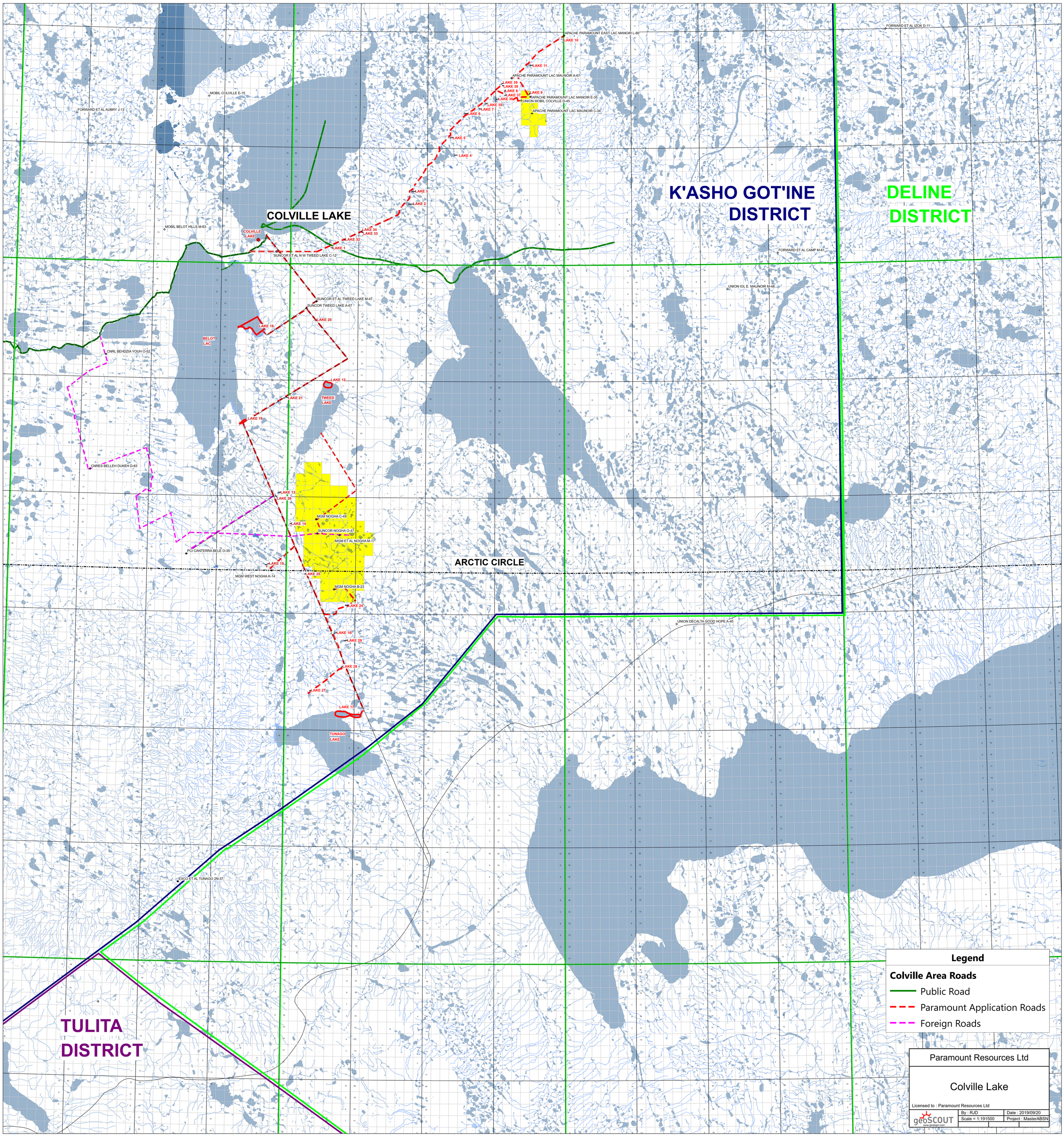
1 Bag oil sponge redial premium absorbent

1 50 feet coil 3/8” poly rope

1 20 litre pail with lid

8 Pair Nitrile protective gloves

Appendix A: Site Maps


127°00'W
126°00'W
125°00'W
124°00'W
67°10'N
67°00'N
66°50'N
66°40'N
66°30'N
66°20'N
66°10'N
66°00'N
65°50'N
K'ASHO GOT'INE DISTRICT
DELINE DISTRICT
TULITA DISTRICT
COLVILLE LAKE
ARCTIC CIRCLE
BELOT LAC
TWEED LAKE
TUNAGO LAKE
APACHE PARAMOUNT EAST LAC MANOIR L-80
APACHE PARAMOUNT LAC MAUNOIR A-67
APACHE PARAMOUNT LAC MANOIR E-35
UNION MOBIL COLVILLE D-45
APACHE PARAMOUNT LAC MAUNOIR C-34
FORWARD ET AL IZOK D-11
MOBIL COLVILLE E-15
FORWARD ET AL AUBRY J-13
MOBIL BELOT HILLS M-63
SUNCOR ET AL N W TWEED LAKE C-12
FORWARD ET AL CAMP M-61
UNION IOL E. MAUNOIR M-48
SUNCOR ET AL TWEED LAKE M-47
SUNCOR TWEED LAKE A-67
CNRL BEHDZIA YOUH O-52
CNRES BELLEH DUKEH D-83
MGM NOGHA C-49
SUNCOR NOGHA O-47
MGM ET AL NOGHA M-17
PCI CANTERRA BELE O-35
MGM WEST NOGHA K-14
MGM NOGHA B-23
UNION DECALTA GOOD HOPE A-40
EXCO ET AL TUNAGO 2N-37
LAKE 1
LAKE 2
LAKE 3
LAKE 4
LAKE 5
LAKE 6
LAKE 7
LAKE 8
LAKE 9
LAKE 10
LAKE 11
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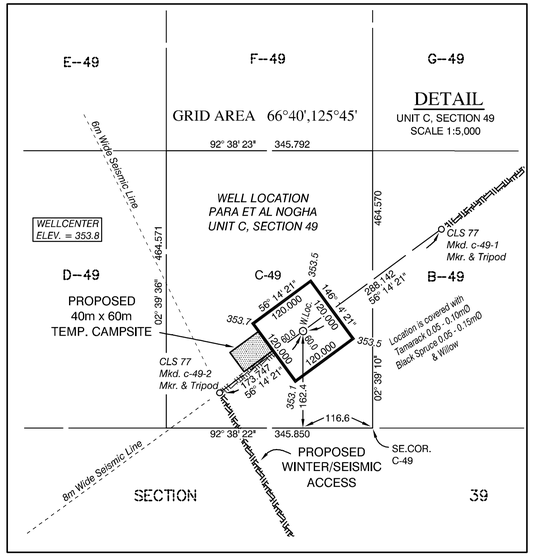
LAKE 34
LAKE 35
LAKE 36
LAKE 37
LAKE 38
LAKE 39
Legend
Colville Area Roads
Public Road
Paramount Application Roads
Foreign Roads
Paramount Resources Ltd
Colville Lake
Licensed to : Paramount Resources Ltd
geoSCOUT
By : RJD
Date : 2019/09/20
Scale = 1:191500
Project : MasterABSN



PLAN AND FIELD NOTES

OF SURVEY OF

PROPOSED EXPLORATORY WELL

PARA ET AL NOGHA

IN UNIT C, SECTION 49

GRID AREA 66° 40' , 125° 45'

NORTHWEST TERRITORIES

CANADA OIL AND GAS LAND REGULATIONS

EXPLORATORY WELL, SAHTU SETTLEMENT LANDS, BLOCK M17.

SCALE 1:20,000

400m 200 0m 400 800 1200 1600m

SURVEYED FOR

PARAMOUNT RESOURCES LTD.

BY : W.V. JOHNSON, CLS

Sept. & Oct., 2001.

THIS SURVEY WAS EXECUTED DURING THE PERIOD OF September 24th to October 2nd., 2001.

Certified Correct and completed on the 9th day of October 2001.

_____ Canada Lands Surveyor

W.V. Johnson
Comm. No. 1393

PARAMOUNT RESOURCES LTD.

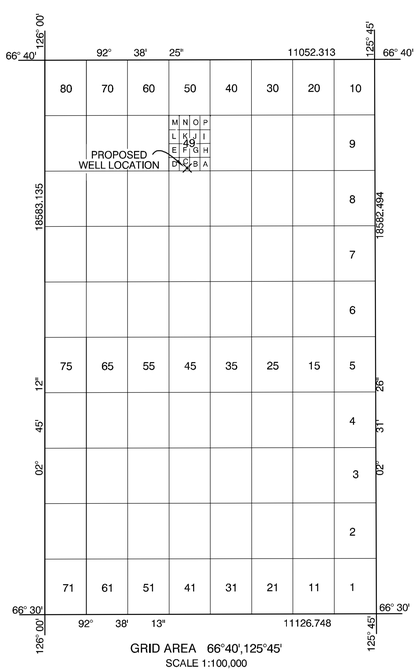
_____

_____

WITNESS

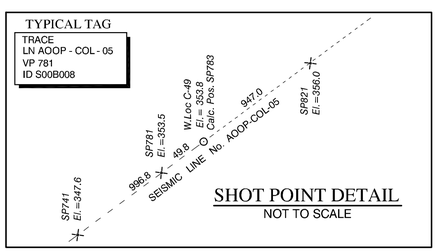
_____

DATE



GRID AREA 66°40',125°45'

SCALE 1:100,000



SHOT POINT DETAIL

NOT TO SCALE

Wellsite control established using differentially corrected GPS observations. All transformations between NAD83 and NAD27 were completed using National Transformation Version 2 program. Geodetic Survey of Canada published coordinate values for monument Yellowknife A.C.P. No.889201' were held fixed. Adjusted values for monument 'Geodetic Survey of Canada Monument No.699013' and comparison to published coordinates are shown below.

GEOGRAPHIC AND UTM COORDINATES, (1983 NAD)					
Station	Latitude(N)	Longitude(W)	Northings	Eastings	Elev.
CONTROL MONUMENTS					
'YELLOWKNIFE' GSC#889201(Pub/Fixed)	62° 28' 51.195"	114° 28' 50.446"	6956724.226	938239.160	207.922
C-49-1 (Adj.)	66° 38' 11.388"	125° 53' 24.039"	7393819.613	372146.788	354.01
C-49-2 (Adj.)	66° 38' 02.536"	125° 53' 54.261"	7393562.993	371762.888	352.21
GSC#699013 (Adj.)	65° 20' 26.060"	126° 36' 52.302"	7251235.428	331796.864	976.054
GSC#699013 (Pub)	65° 20' 26.055"	126° 36' 52.334"	7251235.295	331796.446	976.401
PROPOSED WELL					
C-49	66° 38' 05.866"	125° 53' 42.894"	7393659.525	371907.298	353.8

GRID AREA 66°40' , 125° 45' - GEOGRAPHIC AND UTM COORDINATES, (1927 NAD)				
NE	66° 40' 00"	125° 45' 00"	7396712.619	378480.533
NW	66° 40' 00"	126° 00' 00"	7397221.735	367439.952
SW	66° 30' 00"	126° 00' 00"	7378660.052	366541.294
SE	66° 30' 00"	125° 45' 00"	7378148.150	377662.260
C - 49, N.E.			7393750.489	372119.686
C - 49, N.W.			7393766.414	371774.261
C - 49, S.W.			7393302.344	371752.700
C - 49, S.E.			7393286.416	372098.183
PROPOSED WELL				
C-49	66° 38' 05.420"	125° 53' 35.733"	7393454.025	371989.183

AREAS REQUIRED:

WELLSITE:	120m x 120m =	1.44 ha.
COMMON REMOTE SUMP:	80m x 80m =	0.64 ha.
CAMPSITE:	40m x 60m =	0.24 ha.
TOTAL:		2.32 ha.

LEGEND

UTM coordinates are computed for Zone 10, Central Meridian 123°W. Bearings were derived from differentially corrected GPS Observations, and are referred to meridian 123° W.

Distances are expressed in metres and decimals thereof.

Distances shown in traverse are measured distances reduced to the horizontal at general ground level.

For the computation of coordinates measured distances have been reduced to the UTM plane by multiplying them by an average combined scale factor of 0.9997455

Distances shown on grid area subdivisions are UTM plane, NAD27 Datum. All other dimensions are based on NAD83 datum.

Control monuments found ..... ●
Monuments placed ..... ○
Mkr. denotes metal marker post 2.0m long placed 0.30m away from Post.

Elevations were derived from Geodetic Survey of Canada Acitve Control Point 'Yellowknife' No. 889201 Elev. = 207.922m. (Geoid Separation: HT2000)

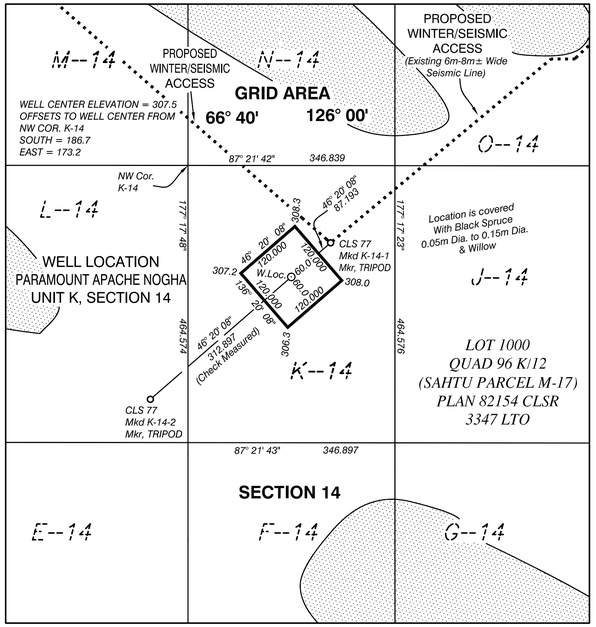
Survey was completed prior to drilling; therefore well as drilled may not necessarily agree with proposed location.

REV.No.	DESCRIPTION	DATE
1	REVISED SPELLING IN TITLE BLOCK	01/10/22

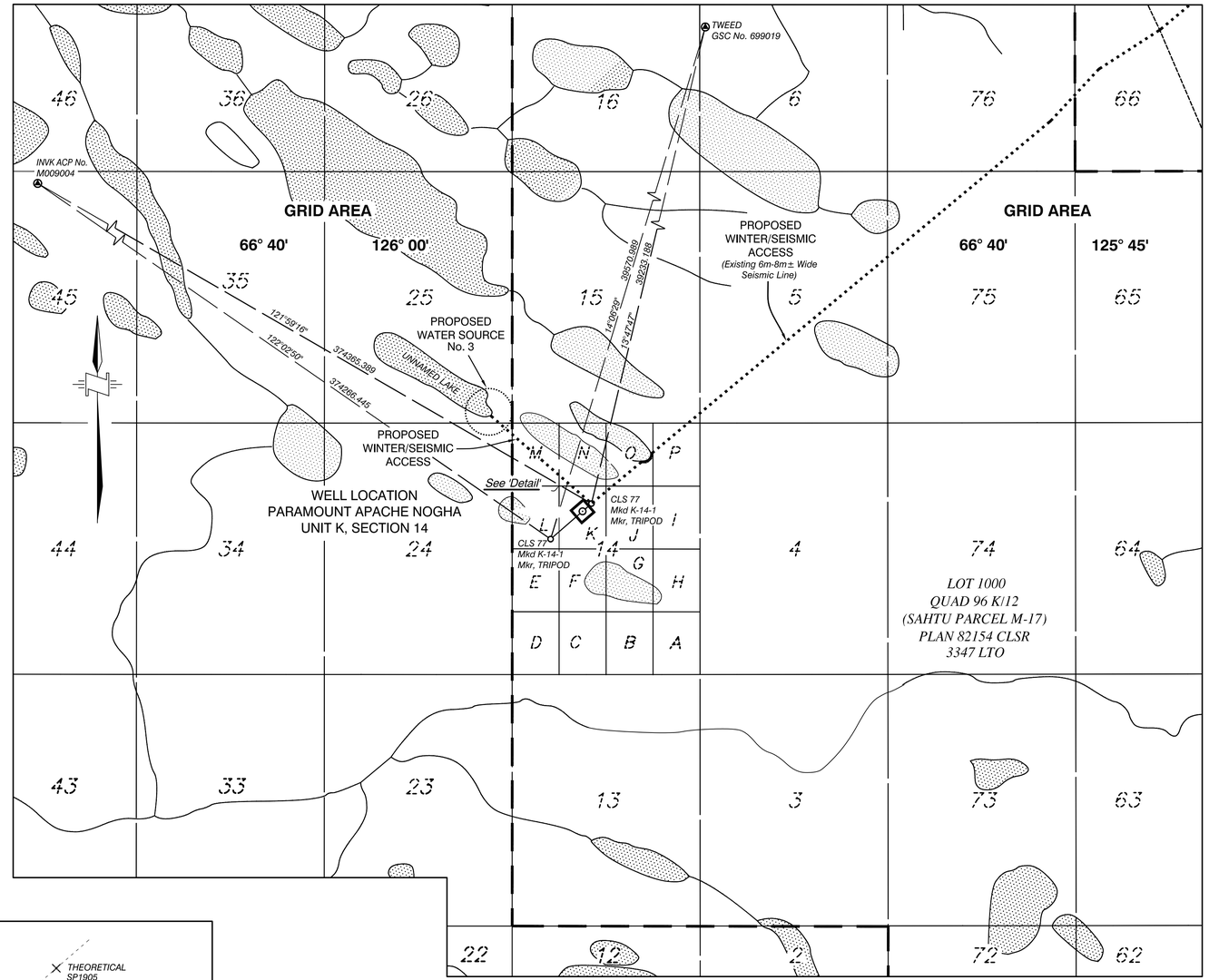
McElhanney

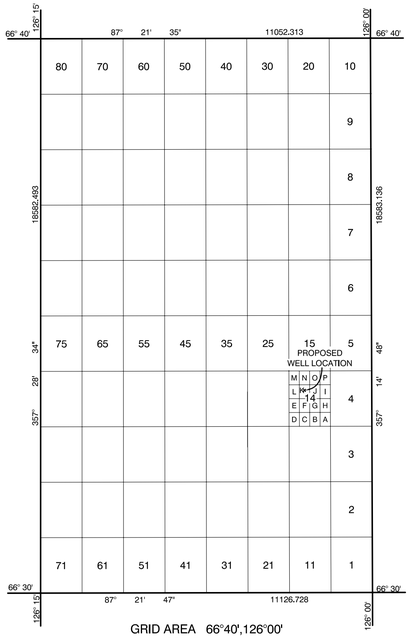
McELHANNEY LAND SURVEYS LTD.
PROFESSIONAL LAND SURVEYORS
10012 - 97th Ave.
Fort St. John, British Columbia
Phone:(250)787-0356, Fax:(250)787-0310

DATE : 01/10/06 JOB No.: 3111-09553WS RH RAP

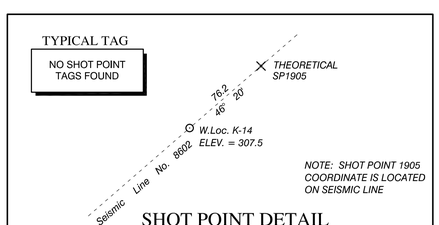


DETAIL
UNIT K, SECTION 14
SCALE 1:5,000





GRID AREA 66°40',126°00'
SCALE 1:100,000



SHOT POINT DETAIL
NOT TO SCALE

AREAS REQUIRED:

WELLSITE:	120m x 120m =	1.44 ha.
COMMON TEMP. CAMPSITE:	60m x 60m =	0.36 ha.
(COMMON TO WELLSITES E-44 & B-23		

LOCATION UNIT A SECTION 31
GRID AREA 66° 40', 125° 45'
NAD 83, ZONE 10)
N = 7378569±
E = 373208±

TOTAL: 1.80 ha.

WATER SOURCE = UNNAMED LAKE LOCATED IN SECTION 25
GRID AREA 66° 40', 126° 00'

NOTE: SEE 1: 250,000 COLVILLE AREA ACCESS MAP FOR ACCESS ROUTING, LOCATION OF PROPOSED WATER SOURCES, COMMON TEMP. CAMPSITES AND CREEK CROSSINGS.

Wellsite control established using differentially corrected GPS observations. Final coordinates for Wellcenter for proposed Well were transformed from NAD83 datum to NAD27 datum using the National Transformation Version 2 program. Geodetic Survey of Canada published coordinate values for monument 'TWEED' GSC No. 699019 were held fixed. Adjusted values for monument 'INVK A.C.P. No, M009004' and comparison to Geodetic Survey Of Canada published coordinates are shown below.

GEOGRAPHIC AND UTM COORDINATES, (1983 NAD)					
Station	Latitude(N)	Longitude(W)	Northings	Eastings	Elev.
CONTROL MONUMENTS					
'TWEED' GSC #699019 (Pub.&Fixed)	66° 53' 54.869"	125° 47' 48.549"	7423679.490	640197.538	473.70
K-14-1 (Adj.)	66° 33' 41.357"	126° 03' 04.621"	7385587.399	630843.676	308.66
K-14-2 (Adj.)	66° 33' 32.891"	126° 03' 29.113"	7385311.229	630554.322	303.98
INVK ACP # M009004 (Adj.)	68° 18' 22.213"	133° 31' 37.008"	7583854.402	313396.525	51.17
INVK ACP # M009004 (Pub.)	68° 18' 22.257"	133° 31' 36.943"	7583855.711	313397.363	49.70
PROPOSED WELL					
W. Loc. K-14	66° 33' 39.512"	126° 03' 09.959"	7385527.212	630780.616	307.54

GRID AREA 66° 40' 126° 00' GEOGRAPHIC AND UTM COORDINATES, (1927 NAD)				
NE	66° 40' 00"	126° 00' 00"	7397221.736	632560.048
NW	66° 40' 00"	126° 15' 00"	7396712.619	621519.467
SW	66° 30' 00"	126° 15' 00"	7378148.151	622337.740
SE	66° 30' 00"	126° 00' 00"	7378660.052	633452.706
K-14, N.E.			7385524.898	631039.133
K-14, N.W.			7385508.933	630692.662
K-14, S.W.			7385044.876	630714.572
K-14, S.E.			7385060.842	631061.101
PROPOSED WELL				
W.Loc. K-14	66° 33' 52.067"	126° 03' 16.536"	7385723.931	630686.780

LEGEND

UTM coordinates are computed for Zone 9, Central Meridian 129°W. Bearings were derived from differentially corrected GPS Observations, and are referred to meridian 129° W.

Distances are expressed in metres and decimals thereof.

Distances shown in traverse are measured distances reduced to the horizontal at general ground level.

For the computation of coordinates measured distances have been reduced to the UTM plane by multiplying them by an average combined scale factor of 0.99976109

Distances shown on grid area subdivisions are UTM plane.

Geodetic Survey Control Monument .....
Monuments placed (CLS 77).....
Well Location.....
Mkr. denotes metal marker post 2.0m long placed 0.30m away from Post.

All posts placed have been marked with the year 2003 and a unique number as shown on the plan.

Elevations were derived from Geodetic Survey of Canada Monument 'TWEED' G.S.C. No. 699019 Elev. = 473.700 m. (Geoid Separation: HT2_0)

Survey was completed prior to drilling; therefore well as drilled may not necessarily agree with proposed location.

PLAN AND FIELD NOTES

OF SURVEY OF

PROPOSED EXPLORATORY WELL

PARAMOUNT APACHE NOGHA

IN UNIT K, SECTION 14

GRID AREA 66° 40' , 126° 00'

NORTHWEST TERRITORIES
CANADA OIL AND GAS LAND REGULATIONS

SCALE 1:20,000
400m 200 0m 400 800 1200 1600m

SURVEYED FOR

PARAMOUNT RESOURCES LTD.

BY : JASON J. WHALE, CLS
SEPTEMBER, 2003.

THIS SURVEY WAS EXECUTED ON AUGUST 30th TO SEPTEMBER 1st, 2003

Certified Correct and completed on the 26th, day of September, 2003.

_____ Canada Lands Surveyor

Jason J. Whale
Comm. No. 1635

PARAMOUNT RESOURCES LTD.

_____

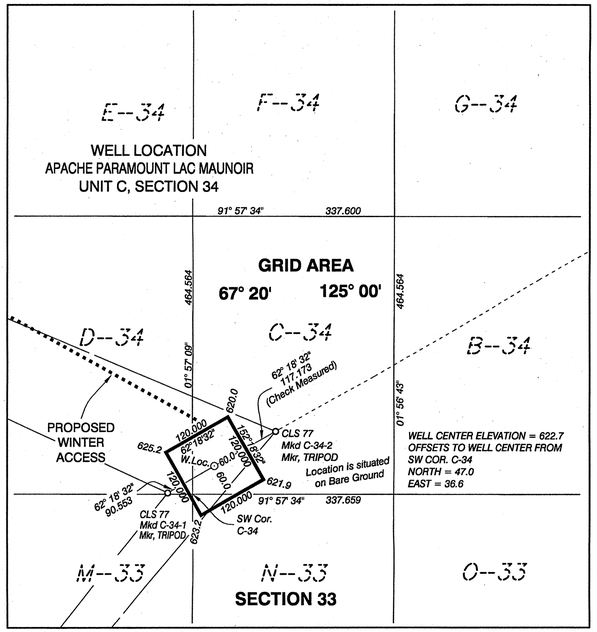
_____
WITNESS

_____
DATE

REV.No.	DESCRIPTION	DATE
0	ORIGINAL PLAN PREPARED	03/09/23

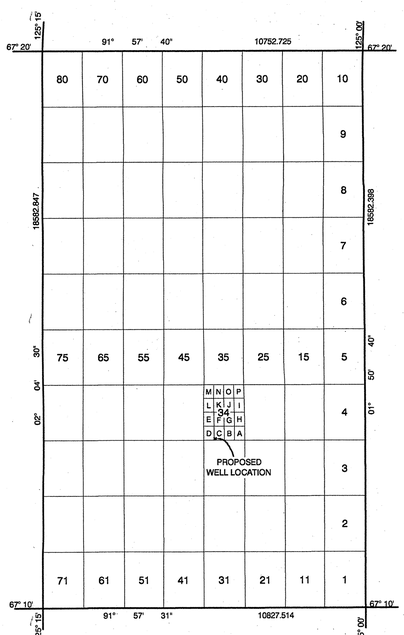
McELHANNEY LAND SURVEYS LTD.
PROFESSIONAL LAND SURVEYORS
10012 - 97th Ave.
Fort St. John, British Columbia
Phone:(250)787-0356, Fax:(250)787-0310
McElhanney

DATE : 03/09/23 JOB No.: 3111-12023WS SB SV

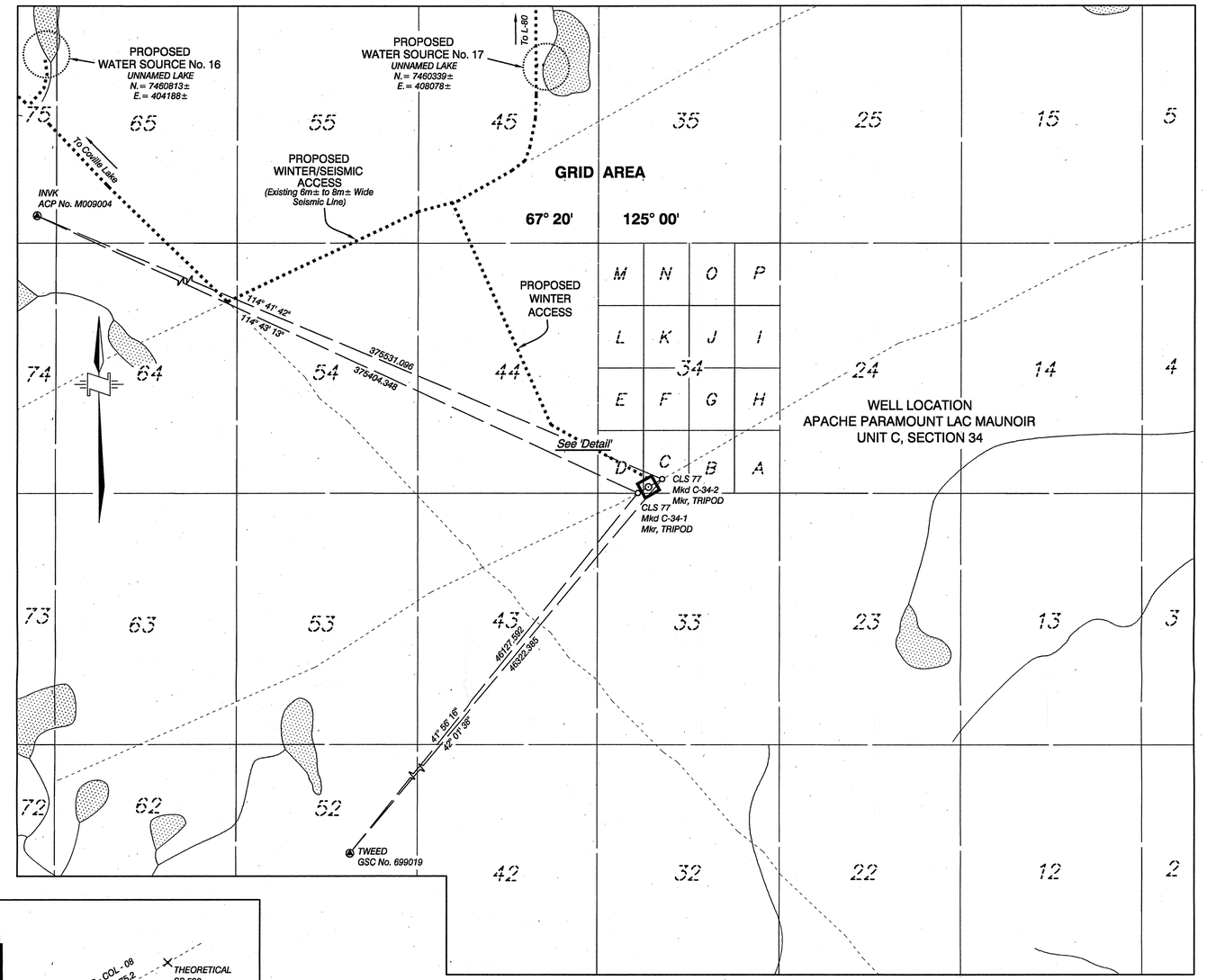


DETAIL

UNIT C, SECTION 34
SCALE 1:5,000



GRID AREA 67°20',125°00'
SCALE 1:100,000



PLAN AND FIELD NOTES

OF SURVEY OF

PROPOSED EXPLORATORY WELL

APACHE PARAMOUNT LAC MAUNOIR

IN UNIT C, SECTION 34

GRID AREA 67° 20' , 125° 00'

NORTHWEST TERRITORIES

CANADA OIL AND GAS LAND REGULATIONS
EXPLORATORY LICENCE No. 399

SCALE 1:20,000

400m 200 0m 400 800 1200 1600m

SURVEYED FOR

APACHE CANADA LTD.

BY : JASON J. WHALE, CLS
SEPTEMBER, 2003.

THIS SURVEY WAS EXECUTED DURING THE PERIOD OF
September 5th to September 6th, 2003.

Certified Correct and completed on the 26th. day of September, 2003.

Canada Lands Surveyor

ASSOCIATION OF CANADA LANDS SURVEYORS
Jason J. Whale
Comm. No. 1635
ASSOCIATION DES ARPENTEURS DES TERRES DU CANADA

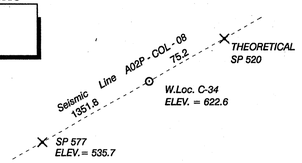
APACHE CANADA LTD.

WITNESS

DATE

TYPICAL TAG

TRACE
NEB 1020
LN 08
VP 577
502B 006



SHOT POINT DETAIL

NOT TO SCALE

AREAS REQUIRED:

WELLSITE:	120m x 120m =	1.44 ha.
REMOTE SUMP	30m x 30m =	0.09 ha.
LOCATION: UNIT J SECTION 5		
GRID AREA 67° 20', 125° 15'		
NAD 83, ZONE 10)		
N = 7460328±		
E = 402256±		
COMMON TEMP. CAMPSITE:	60m x 60m =	0.36 ha.
IN EXISTING CLEARING		
ON NORTH SIDE OF ACCESS		
COMMON TO WELLSITE L-80		
LOCATION: UNIT I SECTION 43		
GRID AREA 67° 20', 125° 15'		
NAD 83, ZONE 10		
N = 7456575±		
E = 397176±		
TOTAL:		1.89 ha.

WATER SOURCES = UNNAMED LAKE LOCATED IN
SECTION 45 AND SECTION 75
GRID AREA 67° 20', 125° 15'

Wellsite control established using differentially corrected GPS observations. Final coordinates for Wellcenter for proposed Well were transformed from NAD83 datum to NAD27 datum using the National Transformation Version 2 program. Geodetic Survey of Canada published coordinate values for monument 'TWEED' G.S.C. No. 699019 were held fixed. Adjusted values for monument 'INVK A.C.P. No, M009004' and comparison to Geodetic Survey of Canada published coordinates are shown below.

GEOGRAPHIC AND UTM COORDINATES, (1983 NAD)					
Station	Latitude(N)	Longitude(W)	Northings	Eastings	Elev.
CONTROL MONUMENTS					
'TWEED' GSC No. 699019 (PUB.&FIXED)	66° 53' 54.869"	125° 47' 48.549"	7422822.629	377577.892	413.70
C-34-1 (Adj.)	67° 13' 00.817"	125° 07' 12.665"	7457122.023	408393.685	624.35
C-34-2 (Adj.)	67° 13' 04.133"	125° 06' 57.632"	7457218.517	408577.548	618.86
INVK ACP No. M009004 (Adj.)	68° 18' 22.240"	133° 31' 36.970"	7614049.045	67525.507	50.76
INVK ACP No. M009004 (Pub.)	68° 18' 22.257"	133° 31' 36.943"	7614049.518	67525.890	49.70
PROPOSED WELL					
W. Loc. C-34	67° 13' 02.262"	125° 07' 06.111"	7457164.088	408473.837	622.65

GRID AREA 67° 20' 125° 00' GEOGRAPHIC AND UTM COORDINATES, (1927 NAD)				
NE	67° 20' 00'	125° 00' 00'	7469739.872	413999.219
NW	67° 20' 00'	125° 15' 00'	7470107.823	403252.791
SW	67° 10' 00'	125° 15' 00'	7451537.162	402579.914
SE	67° 10' 00'	125° 00' 00'	7451167.103	413401.102
C-34, N.E.			7457364.854	408871.851
C-34, N.W.			7457376.397	408534.448
C-34, S.W.			7456912.102	408518.619
C-34, S.E.			7456900.558	408856.080
PROPOSED WELL				
W.Loc. C-34	67° 13' 01.691"	128° 06' 58.820"	7456957.778	408556.824

LEGEND

UTM coordinates are computed for Zone 10, Central Meridian 123°W. Bearings were derived from differentially corrected GPS Observations, and are referred to meridian 123° W.

Distances are expressed in metres and decimals thereof.

Distances shown in traverse are measured distances reduced to the horizontal at general ground level.

For the computation of coordinates measured distances have been reduced to the UTM plane by multiplying them by an average combined scale factor of 0.9996049

Distances shown on grid area subdivisions are UTM plane.

Geodetic Survey Control Monument ..... ⊕
Monuments placed (CLS 77)..... ○
Well Location..... ⊙
Mkr. denotes metal marker post 2.0m long placed 0.30m away from Post.

All posts placed have been marked with the year 2003 and a unique number as shown on the plan.

Elevations were derived from Geodetic Survey of Canada Monument 'TWEED' G.S.C. No. 699019 Elev. = 473.700 m. (Geoid Separation: HT2_0)

Survey was completed prior to drilling; therefore well as drilled may not necessarily agree with proposed location.

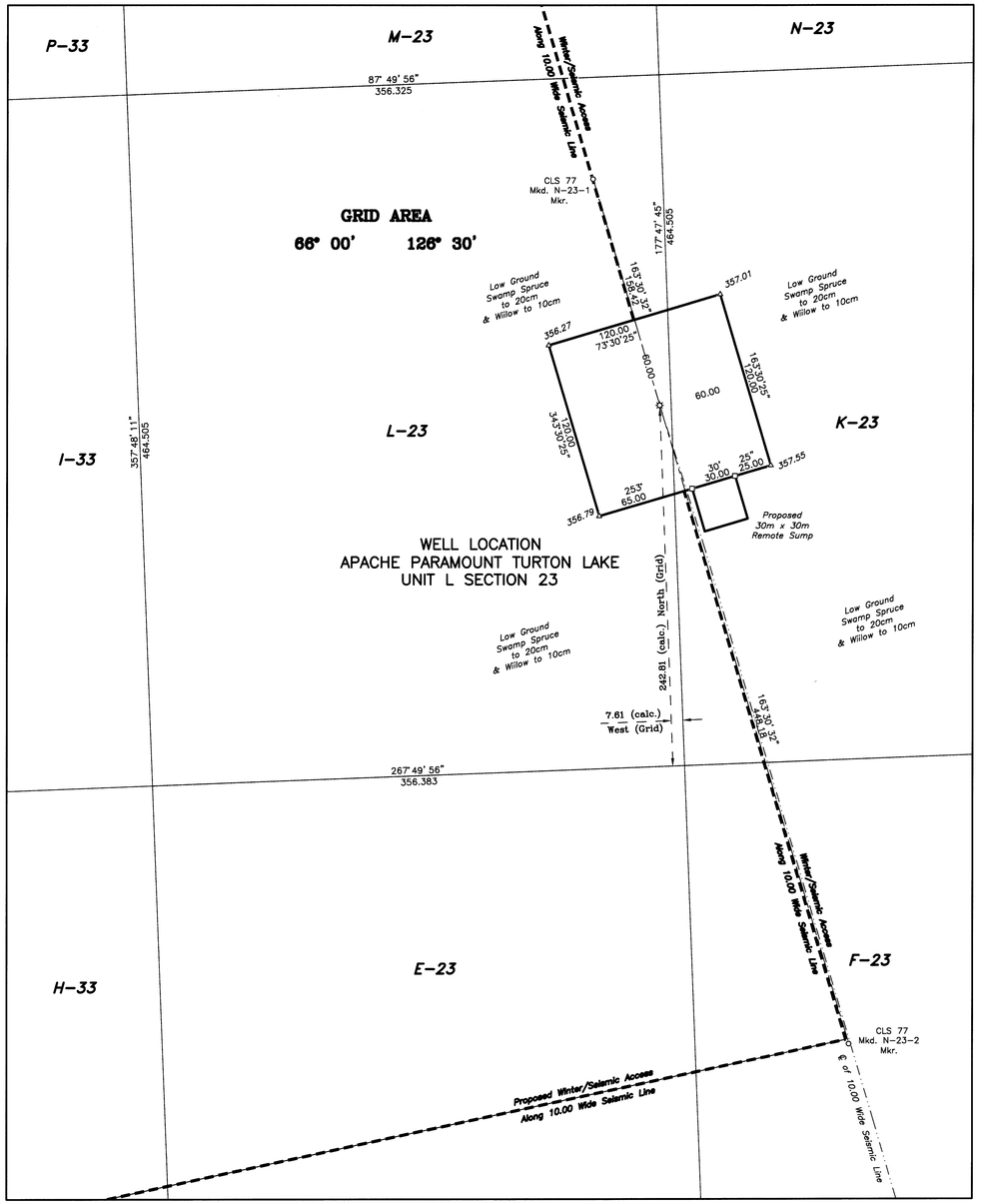
NOTE: SEE 1: 250,000 COLVILLE AREA ACCESS MAP FOR ACCESS ROUTING, LOCATION OF COMMON TEMP. CAMPSITE, REMOTE SUMP, PROPOSED WATER SOURCES AND CREEK CROSSINGS.

REV.No.	DESCRIPTION	DATE
0	ORIGINAL PLAN PREPARED	03/09/26

McELHANNEY LAND SURVEYS LTD.
PROFESSIONAL LAND SURVEYORS
10012 - 97th Ave.
Fort St. John, British Columbia
Phone:(250)787-0356, Fax:(250)787-0310

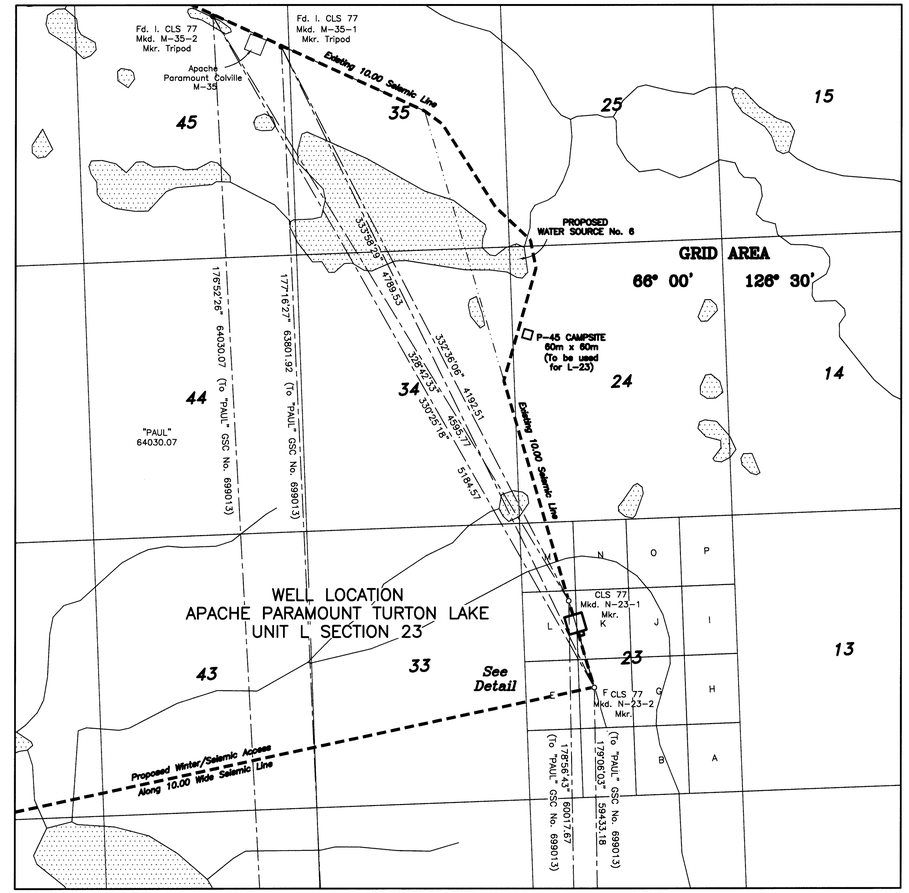
McElhanney

DATE : 03/09/26 JOB No.: 3111-12020WS SB SV



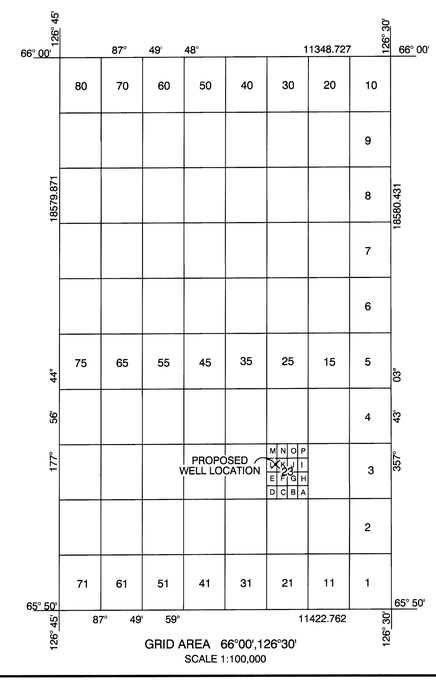
DETAIL

SCALE 1:2,000



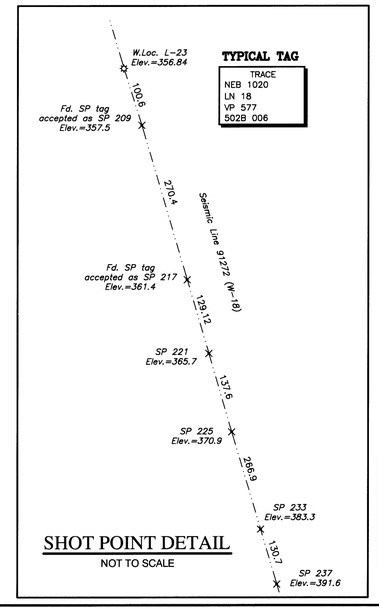
LOCATION PLAN

Scale 1:20,000



GRID AREA 66°00',126°30'

SCALE 1:100,000



SHOT POINT DETAIL

NOT TO SCALE

PLAN AND FIELD NOTES

OF SURVEY OF

PROPOSED EXPLORATORY WELL

APACHE PARAMOUNT TURTON LAKE
IN UNIT L, SECTION 23
GRID AREA 66° 00' , 126° 30'

NORTHWEST TERRITORIES
CANADA OIL AND GAS LAND REGULATIONS
EXPLORATORY WELL, NORTHWEST TERRITORIES

SCALE 1:20,000

400m 200 0m 400 800 1200 1600m

SURVEYED FOR

APACHE CANADA LTD.

BY : JOHN E. LANDRY C.L.S., A.L.S
August, 2004.

THIS SURVEY WAS EXECUTED DURING THE PERIOD OF
July 25th to August 1st, 2004.

Certified Correct and completed on the 18th day of August, 2004.

Canada Lands Surveyor

John Landry
Comm. No. 1287

APACHE CANADA LTD.

WITNESS

DATE

LEGEND

UTM coordinates are computed for Zone 9, Central Meridian 129°W.
Bearings were derived from differentially corrected GPS Observations, and are referred to meridian 129° W.

Distances are expressed in metres and decimals thereof.
Distances shown in traverse are measured distances reduced to the horizontal at general ground level.
For the computation of coordinates measured distances have been reduced to the UTM plane by multiplying them by an average combined scale factor of 0.9996829.

Distances shown on grid area subdivisions are UTM plane, NAD27 Datum.

Geodetic Survey Control Monument is shown thus.....
Monuments found are shown thus.....
Spikes placed are shown thus.....
Monuments placed are shown thus (CLS 77).....
Lathe placed shown thus.....
Well Center is shown thus.....
Shot Points are shown thus.....
Areas Dealt With shown thus .....
Traverse Lines are shown thus .....
Seismic Lines are shown thus .....
Elevations are shown thus 325.10

Mkr. denotes metal marker post 2.0m long placed 0.3m away from post.

Elevations were derived from Geodetic Control Monument "PAUL" No. 699013 Elev. = 967.400m.
(Geoid Separation: HT2_0)

Survey was completed prior to drilling; therefore well as drilled may not necessarily agree with proposed location.

Wellsite control established using differentially corrected GPS observations. All transformations between NAD83 and NAD27 were completed using National Transformation Version 2 program. Geodetic Survey of Canada published coordinate values for GSC "PAUL" No. 699013 were held fixed. Found Iron Posts M-35-1 andM-35-2 were observed as checks.

AREAS REQUIRED:

WELLSITE: 120m x 120m = 1.44 ha.

REMOTE SUMP: 30m x 30m = 0.09 ha.

GEOGRAPHIC AND UTM COORDINATES, (1983 NAD)

Station	Latitude(N)	Longitude(W)	Northings	Eastings	Elev.
CONTROL MONUMENTS					
PAUL GSC NO. 699 013 (Pub.)	65° 20' 26.055"	126° 36' 52.334"	7248512.427	611035.337	967.40
N-23-1	65° 52' 43.310"	126° 35' 19.929"	7308500.901	609930.883	356.35
N-23-2	65° 52' 24.333"	126° 35' 08.116"	7307919.446	610103.031	364.76
M-35-1	65° 54' 52.933"	126° 38' 16.484"	7312426.944	607544.684	376.56
M-35-2	65° 54' 45.761"	126° 37' 40.958"	7312221.946	608002.206	379.27
PROPOSED WELL					
L - 23, WELLCENTER	65° 52' 38.354"	126° 35' 13.844"	7308349.045	609975.836	356.84

GRID AREA 66°00' , 126° 30' - GEOGRAPHIC AND UTM COORDINATES, (1927 NAD)

NE	66° 00' 00"	126° 30' 00"	7321981.704	613447.099
NW	66° 00' 00"	126° 45' 00"	7321552.013	602106.509
SW	65° 50' 00"	126° 45' 00"	7302984.083	602772.541
SE	65° 50' 00"	126° 30' 00"	7303416.016	614187.134
L - 23 N.E.			7308373.315	610066.854
L - 23 N.W.			7308359.836	609710.784
L - 23 S.W.			7307895.673	609728.591
L - 23 S.E.			7307909.154	610084.719
PROPOSED WELL				
L - 23, WELLCENTER	65° 52' 38.008"	126° 35' 09.979"	7308151.507	610067.781
CONTROL MONUMENTS				
N - 23 - 1	65° 52' 42.964"	126° 35' 13.064"	7308303.367	610022.829
N - 23 - 2	65° 52' 23.987"	126° 35' 01.253"	7307721.896	610194.971

REV.No.	DESCRIPTION	BY	DATE
1	CHANGED WELL NAME	EK	Sept.03,2004

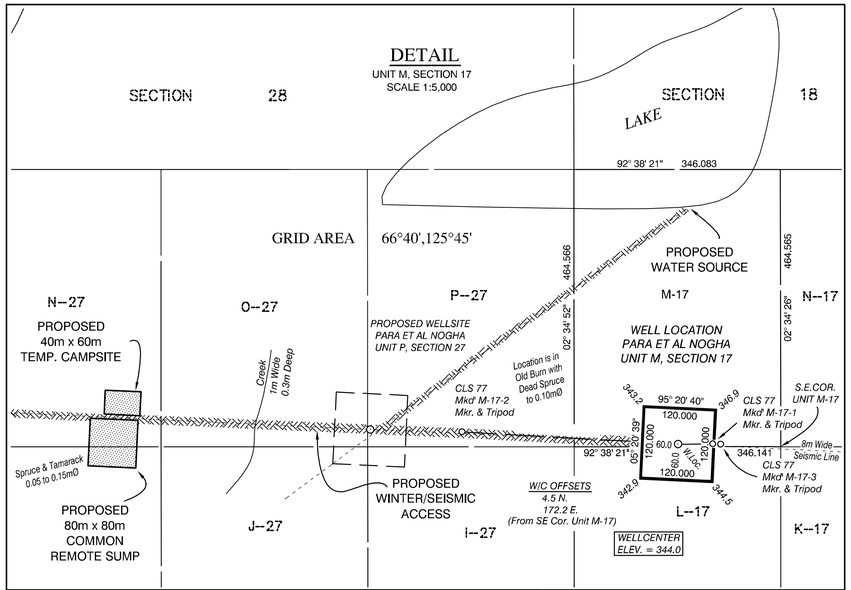
JOHN E. LANDRY
CANADA LANDS SURVEYOR

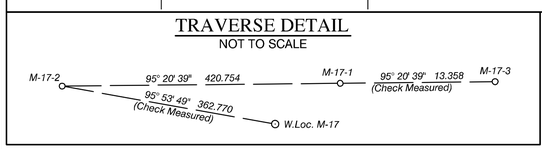
McELHANNEY LAND SURVEYS LTD.
PROFESSIONAL LAND SURVEYORS
138, 14315-118 Avenue
Edmonton, Alberta
PH: (780) 451-3420 FAX: (780) 452-7033

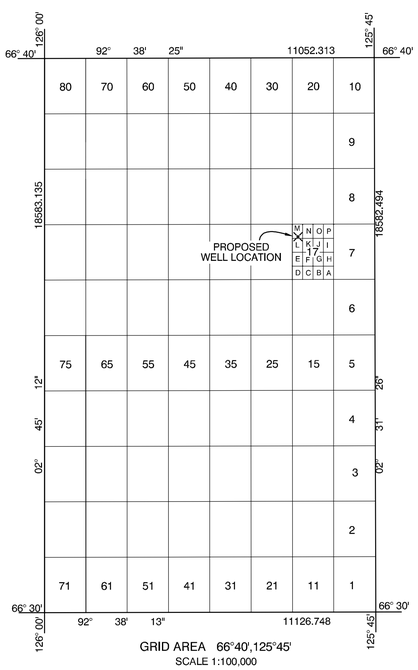
McElhanney

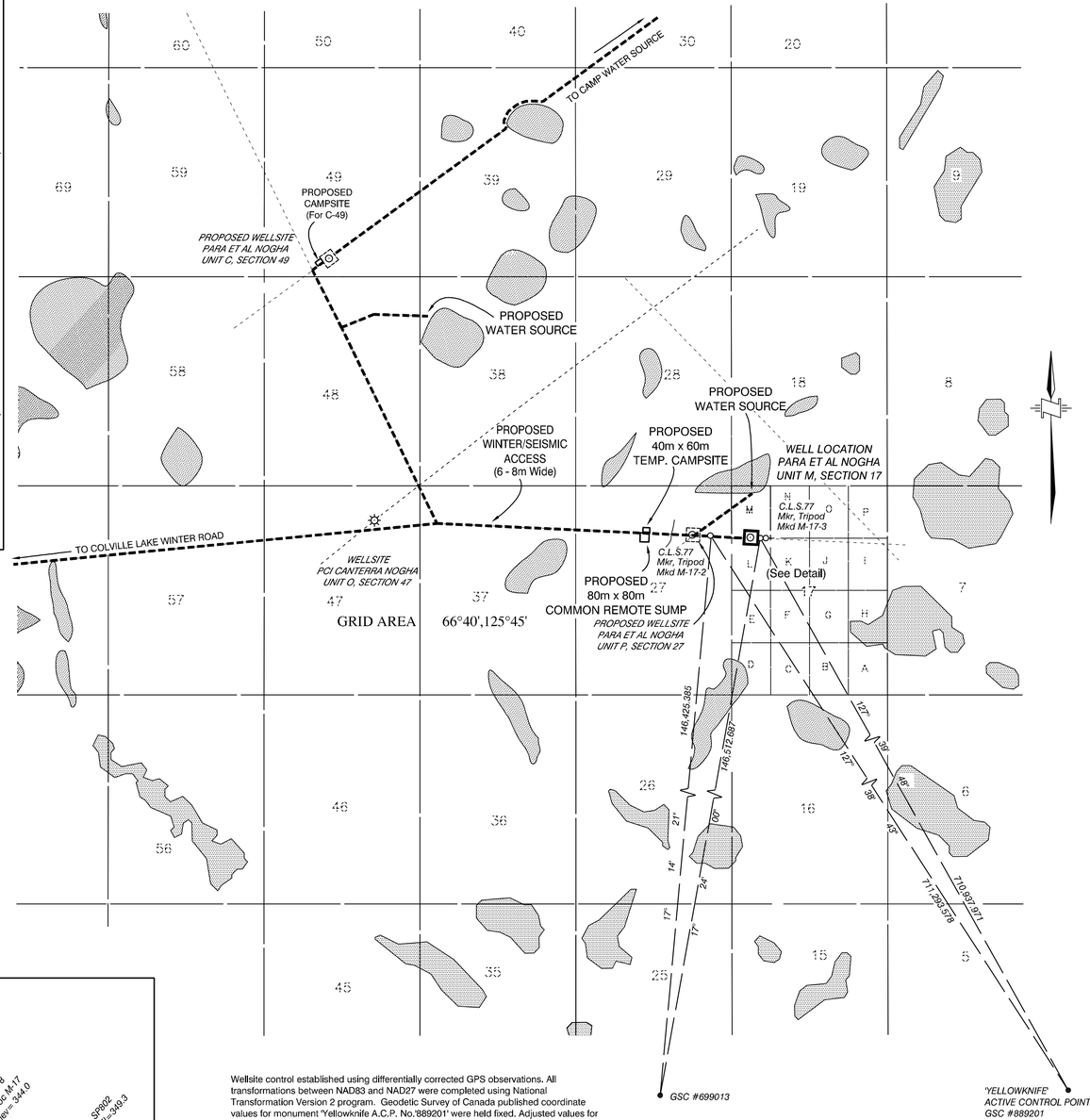
Date: Aug.18, 2004
Plan No.: 1 of 1
Job No.: 321115555
Scale: As Shown
File No.: 15555WS1 NB

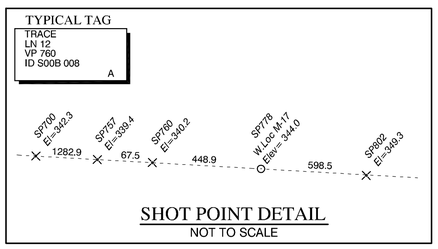
Plan ID E15555WS1











Wellsite control established using differentially corrected GPS observations. All transformations between NAD83 and NAD27 were completed using National Transformation Version 2 program. Geodetic Survey of Canada published coordinate values for monument 'Yellowknife A.C.P. No.'889201' were held fixed. Adjusted values for monument 'Geodetic Survey of Canada Monument No.699013' and comparison to published coordinates are shown below.

GEOGRAPHIC AND UTM COORDINATES, (1983 NAD)					
Station	Latitude(N)	Longitude(W)	Northings	Eastings	Elev.
CONTROL MONUMENTS					
'YELLOWKNIFE' GSC#889201(Pub/Fixed)	62° 28' 51.195"	114° 28' 50.446"	6956724.226	938239.160	207.922
M-17-1 (Adj.)	66° 36' 45.746"	125° 48' 33.270"	7391006.761	375598.652	345.89
M-17-2 (Adj.)	66° 36' 46.400"	125° 49' 07.411"	7391045.939	375179.838	341.58
GSC#699013 (Adj.)	65° 20' 26.060"	126° 36' 52.302"	7251235.428	331796.864	976.054
GSC#699013 (Pub)	65° 20' 26.055"	126° 36' 52.334"	7251235.295	331796.446	976.401
PROPOSED WELL					
M-17	66° 36' 45.723"	125° 48' 37.990"	7391008.678	375540.593	344.0
TRAVERSE STATIONS					
M-17-3	66° 36' 45.725"	125° 48' 32.187"	7391005.517	375611.948	345.95

GRID AREA 66°40' , 125° 45' - GEOGRAPHIC AND UTM COORDINATES, (1927 NAD)				
NE	66° 40' 00"	125° 45' 00"	7396712.619	378480.533
NW	66° 40' 00"	126° 00' 00"	7397221.735	367439.952
SW	66° 30' 00"	126° 00' 00"	7378660.052	366547.294
SE	66° 30' 00"	125° 45' 00"	7378148.150	377662.260
M - 17, N.E.			7391254.830	375815.042
M - 17, N.W.			7391270.766	375469.327
M - 17, S.W.			7390806.672	375448.405
M - 17, S.E.			7390790.734	375794.179
PROPOSED WELL				
M-17	66° 36' 45.274"	125° 48' 30.860"	7390803.114	375622.368

AREAS REQUIRED:

WELLSITE:	120m x 120m =	1.44 ha.
COMMON REMOTE SUMP:	80m x 80m =	0.64 ha.
CAMPSITE:	40m x 60m =	0.24 ha.
TOTAL:		2.32 ha.

LEGEND

UTM coordinates are computed for Zone 10, Central Meridian 123°W. Bearings were derived from differentially corrected GPS Observations, and are referred to meridian 123° W.

Distances are expressed in metres and decimals thereof.

Distances shown in traverse are measured distances reduced to the horizontal at general ground level.

For the computation of coordinates measured distances have been reduced to the UTM plane by multiplying them by an average combined scale factor of 0.9997357

Distances shown on grid area subdivisions are UTM plane, NAD27 Datum. All other dimensions are based on NAD83 datum.

Control monuments found ..... ●
Monuments placed ..... ○
Mkr. denotes metal marker post 2.0m long placed 0.30m away from Post.

Elevations were derived from Geodetic Survey of Canada Acitve Control Point 'Yellowknife' No. 889201 Elev. = 207.922m. (Geoid Separation: HT2000)

Survey was completed prior to drilling; therefore well as drilled may not necessarily agree with proposed location.

PLAN AND FIELD NOTES

OF SURVEY OF

PROPOSED EXPLORATORY WELL

PARA ET AL NOGHA

IN UNIT M, SECTION 17

GRID AREA 66° 40' , 125° 45'

NORTHWEST TERRITORIES

CANADA OIL AND GAS LAND REGULATIONS
EXPLORATORY WELL, SAHTU SETTLEMENT LANDS, BLOCK M17.

SCALE 1:25,000

500m 250 0m 500 1000 1500 2000m

SURVEYED FOR

PARAMOUNT RESOURCES LTD.

BY : W.V. JOHNSON, CLS
SEPT. & OCT. 2001.

THIS SURVEY WAS EXECUTED DURING THE PERIOD OF September 24th to October 2nd., 2001.

Certified Correct and completed on the 9th. day of October, 2001.

_____ Canada Lands Surveyor

ASSOCIATION OF CANADA LANDS SURVEYORS
W.V. Johnson
Comm. No. 1393
ASSOCIATION DES ARPENTEURS DES TERRES DU CANADA

PARAMOUNT RESOURCES LTD.

_____

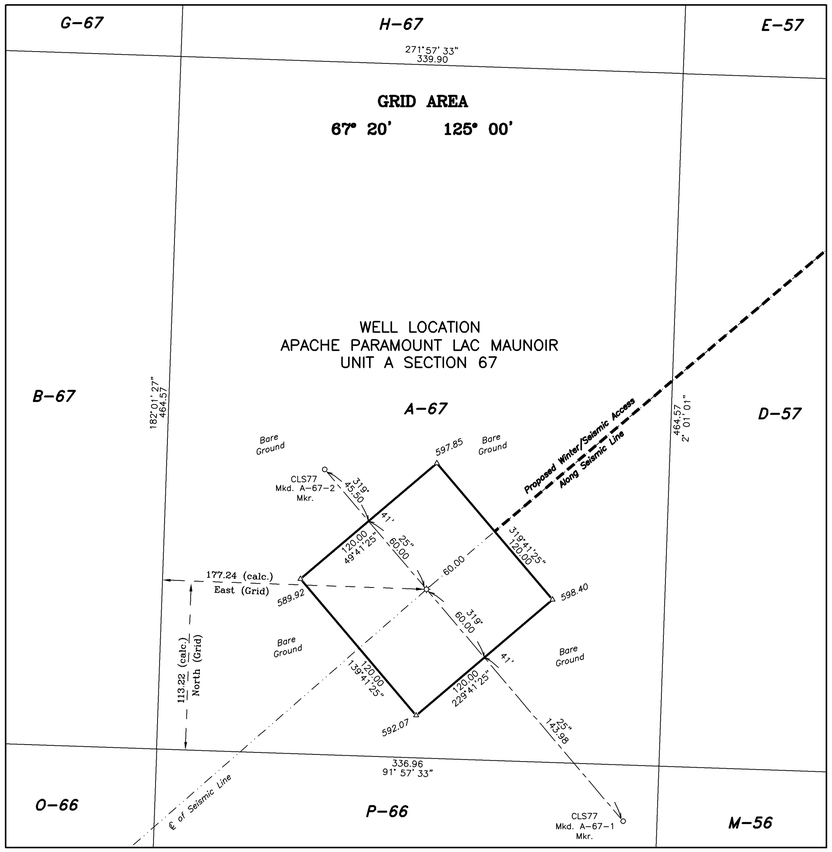
_____
WITNESS

_____
DATE

REV.No.	DESCRIPTION	DATE
1	REVISED SPELLING IN TITLE BLOCK	01/10/22

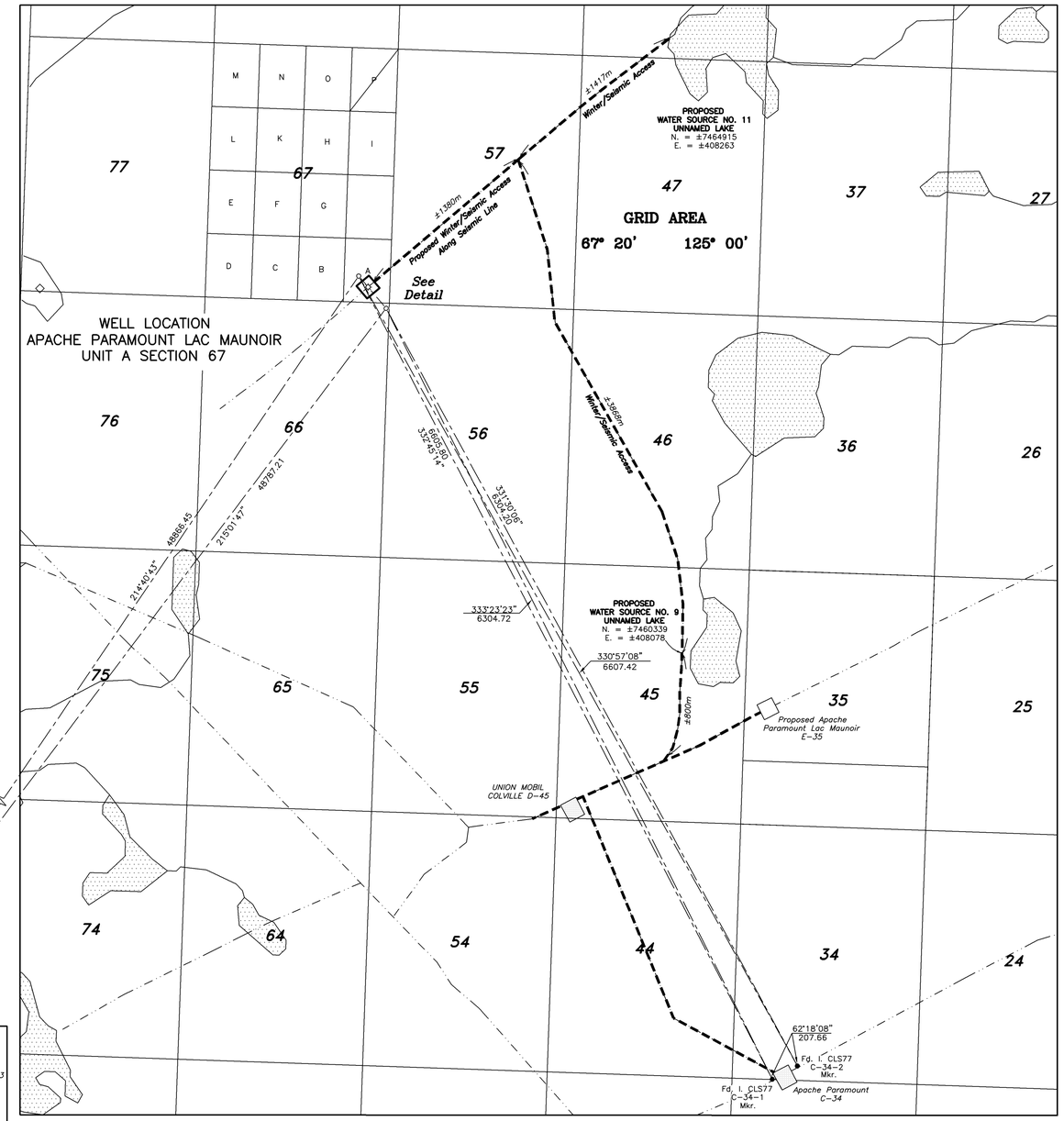
McElhanney
McELHANNEY LAND SURVEYS LTD.
PROFESSIONAL LAND SURVEYORS
10012 - 97th Ave.
Fort St. John, British Columbia
Phone:(250)787-0356, Fax:(250)787-0310

DATE : 01/10/08 JOB No.: 3111-09554WS RH RAP



DETAIL

SCALE 1:2,000



LOCATION PLAN

Scale 1:20,000

PLAN AND FIELD NOTES

OF SURVEY OF

PROPOSED EXPLORATORY WELL

APACHE PARAMOUNT LAC MAUNOIR

IN UNIT A, SECTION 67

GRID AREA 67° 20' , 125° 00'

NORTHWEST TERRITORIES

CANADA OIL AND GAS LAND REGULATIONS

EXPLORATORY WELL, NORTHWEST TERRITORIES

SCALE 1:20,000

400m 200 0m 400 800 1200 1600m

SURVEYED FOR

APACHE CANADA LTD.

BY : JOHN E. LANDRY C.L.S., A.L.S

August, 2004.

THIS SURVEY WAS EXECUTED DURING THE PERIOD OF

July 24th to July 27th., 2004.

Certified Correct and completed on the 19th day of August, 2004.

_____ Canada Lands Surveyor

John Landry
Comm. No. 1287

APACHE CANADA LTD.

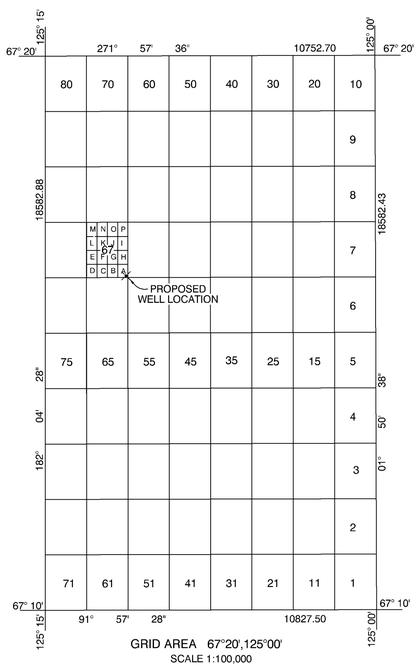
_____

_____

WITNESS

_____

DATE



GRID AREA 67°20',125°00'

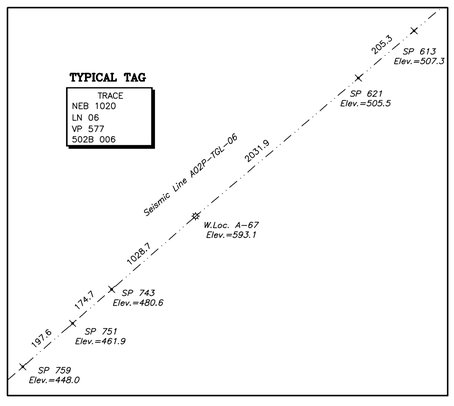
SCALE 1:100,000

AREA REQUIRED:

WELLSITE: 120m x 120m = 1.44 ha.

REMOTE SUMP AND CAMPSITE
FOR C-34 GRID AREA 67°20' 125°00'
TO BE USED FOR A-67.

"TWEED"
GSC No. 699019



SHOT POINT DETAIL

NOT TO SCALE

GRID AREA 67°20' , 125° 00' - GEOGRAPHIC AND UTM COORDINATES, (1927 NAD)				
NE	67° 20' 00"	125° 00' 00"	7469739.872	413999.219
NW	67° 20' 00"	125° 15' 00"	7470107.823	403252.791
SW	67° 10' 00"	125° 15' 00"	7451537.162	402579.914
SE	67° 10' 00"	125° 00' 00"	7451167.103	413401.102
A - 67 N.E.			7463051.640	405694.078
A - 67 N.W.			7463063.163	405357.376
A - 67 S.W.			7462598.885	405340.963
A - 67 S.E.			7462587.360	405677.723
PROPOSED WELL				
A - 67, WELLCENTER	67° 16' 03.782"	125° 11' 28.341"	7462705.939	405521.907

Wellsite control established using differentially corrected GPS observations. All transformations between NAD83 and NAD27 were completed using National Transformation Version 2 program. Geodetic Survey of Canada published coordinate values for "TWEED" G.S.C. No. 699019 were held fixed. Found Iron Posts C-34-1 and C-34-2 were observed as checks.

GEOGRAPHIC AND UTM COORDINATES, (1983 NAD)					
Station	Latitude(N)	Longitude(W)	Northings	Eastings	Elev.
CONTROL MONUMENTS					
"TWEED" G.S.C. No. 699019 (Pub.)	66° 53' 54.869"	125° 47' 48.549"	7422822.629	377577.692	413.70
C-34-1	67° 13' 00.817"	125° 07' 12.665"	7457122.023	408393.685	624.35
C-34-2	67° 13' 04.134"	125° 06' 57.632"	7457218.556	408577.553	618.90
PROPOSED WELL					
A - 67, WELLCENTER	67° 16' 04.353"	125° 11' 35.665"	7462912.211	405438.872	593.10

LEGEND

UTM coordinates are computed for Zone 10, Central Meridian 123°W. Bearings were derived from differentially corrected GPS Observations, and are referred to meridian 123° W.

Distances are expressed in metres and decimals thereof.

Distances shown in traverse are measured distances reduced to the horizontal at general ground level.

For the computation of coordinates measured distances have been reduced to the UTM plane by multiplying them by an average combined scale factor of 0.9996119.

Distances shown on grid area subdivisions are UTM plane, NAD27 Datum.

Geodetic Survey Control Monument is shown thus.....
Found iron posts are shown thus.....
Spikes placed are shown thus.....
Monuments placed are shown thus.....
Well Center is shown thus.....
Shot Points are shown thus.....
Areas Dealt With shown thus .....
Traverse Lines are shown thus .....
Seismic Lines are shown thus .....
Elevations are shown thus 325.10

Mkr. denotes metal marker post 2.0m long placed 0.3m away from post.

Elevations were derived from G.S.C. "TWEED" No. 699019.
Elev. = 413.70m.
(Geoid Separation: HT2_0)

Survey was completed prior to drilling; therefore well as drilled may not necessarily agree with proposed location.

REV.No.	DESCRIPTION	BY	DATE

JOHN E. LANDRY
CANADA LANDS SURVEYOR

McELHANNEY LAND SURVEYS LTD.
PROFESSIONAL LAND SURVEYORS
138, 14315-118 Avenue
Edmonton, Alberta
PH: (780) 451-3420 FAX: (780) 452-7033

McElhanney

Date: Aug.19, 2004

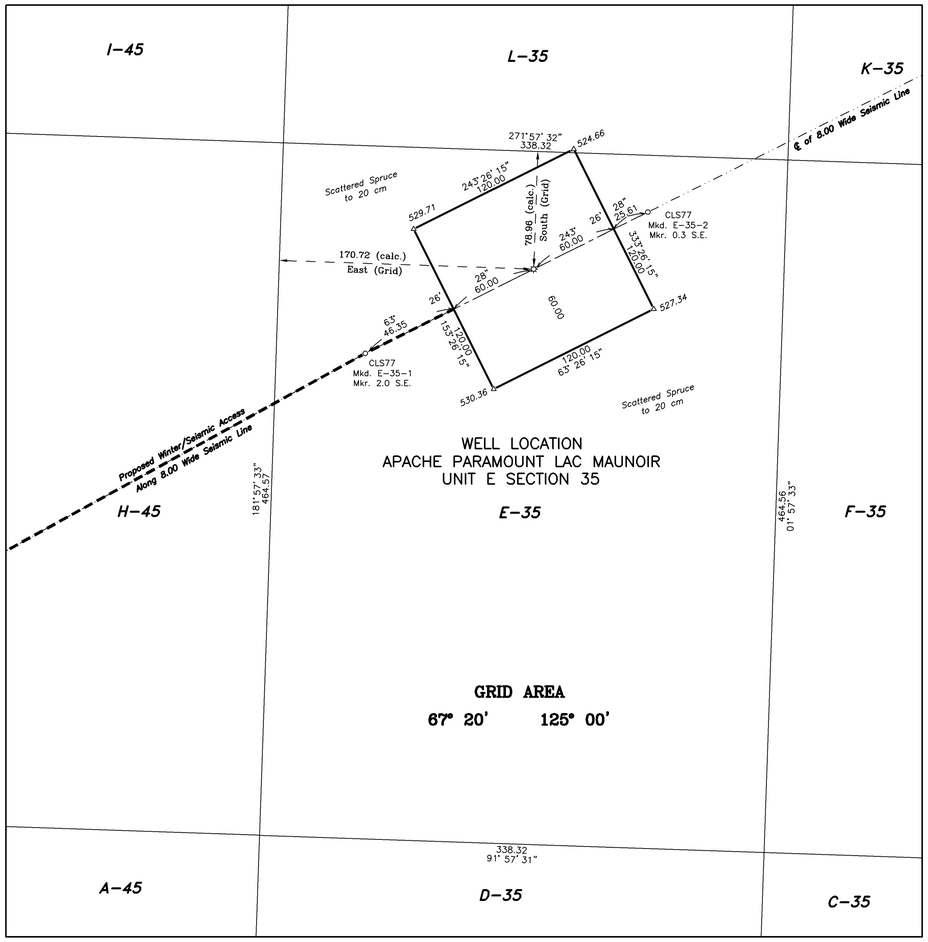
Plan No.: 1 of 1

Job No.: 321115557

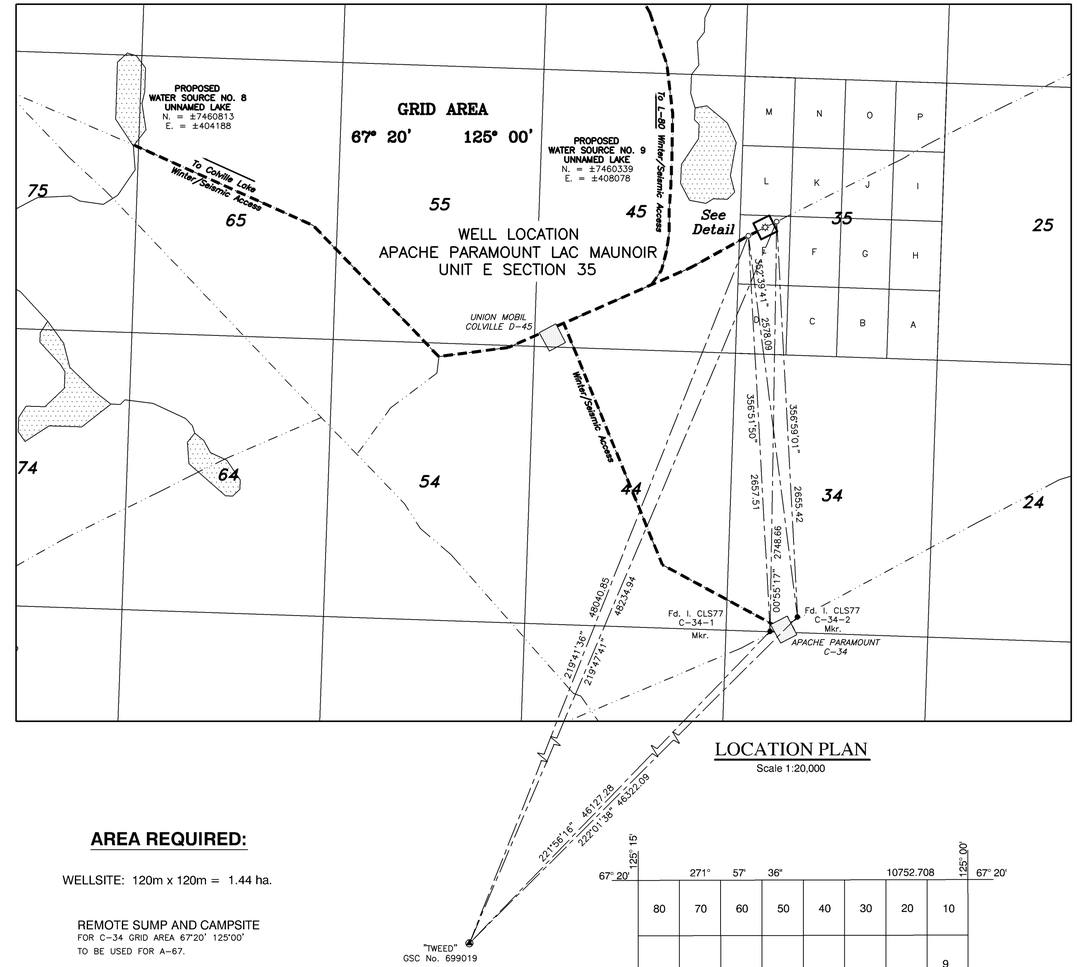
Scale: As Shown

File No.: 15557WS1 NB

Plan ID E15557WS1



DETAIL
SCALE 1:2,000

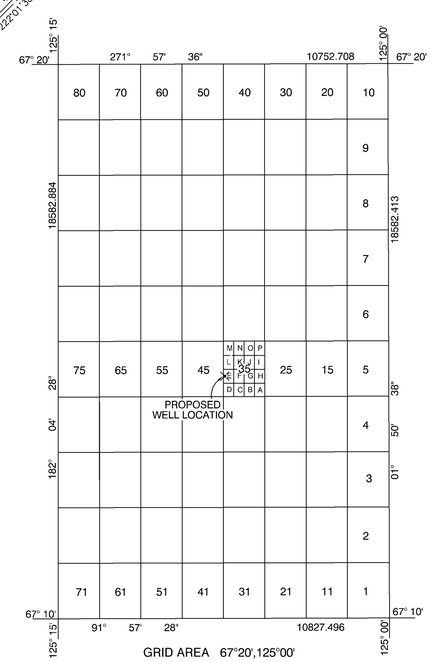


LOCATION PLAN
Scale 1:20,000

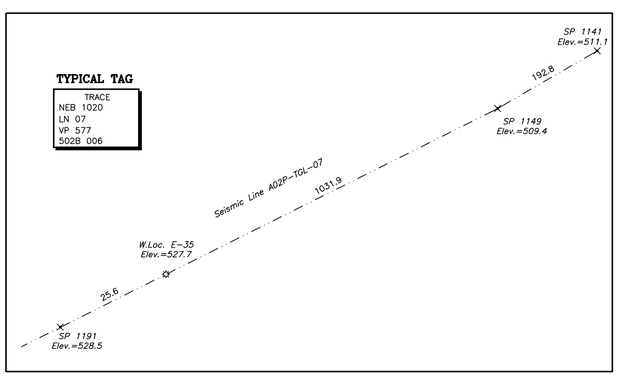
AREA REQUIRED:

WELLSITE: 120m x 120m = 1.44 ha.

REMOTE SUMP AND CAMPSITE
FOR C-34 GRID AREA 67°20' 125°00'
TO BE USED FOR A-67.



GRID AREA 67°20',125°00'
SCALE 1:100,000



SHOT POINT DETAIL
NOT TO SCALE

Wellsite control established using differentially corrected GPS observations. All transformations between NAD83 and NAD27 were completed using National Transformation Version 2 program. Geodetic Survey of Canada published coordinate values for "TWEED" GSC No. 699019 were held fixed. Found Iron Posts C-34-1 and C-34-2 and comparison to previous attained coordinates are shown below.

GEOGRAPHIC AND UTM COORDINATES, (1983 NAD)					
Station	Latitude(N)	Longitude(W)	Northings	Eastings	Elev.
CONTROL MONUMENTS					
"TWEED" (Pub.)	66° 53' 54.869"	125° 47' 48.549"	7422822.629	377577.692	413.70
C-34-1(Published/Fixed)	67° 13' 00.817"	125° 07' 12.665"	7457122.023	408393.685	624.35
C-34-2 (Pub.)	67° 13' 04.133"	125° 06' 57.632"	7457218.517	408577.548	618.86
C-34-2 (Adj.)	67° 13' 04.134"	125° 06' 57.632"	7457218.556	408577.553	618.90
PROPOSED WELL					
E - 35, WELLCENTER	67° 14' 28.201"	125° 07' 23.068"	7459831.002	408361.326	527.70

GRID AREA 67°20' , 125° 00' - GEOGRAPHIC AND UTM COORDINATES, (1927 NAD)				
NE	67° 20' 00"	125° 00' 00"	7469739.872	413999.219
NW	67° 20' 00"	125° 15' 00"	7470107.823	403252.791
SW	67° 10' 00"	125° 15' 00"	7451537.162	402579.914
SE	67° 10' 00"	125° 00' 00"	7451167.103	413401.102
E - 35 N.E.			7459697.835	408614.604
E - 35 N.W.			7459709.404	408276.482
E - 35 S.W.			7459245.111	408260.594
E - 35 S.E.			7459233.542	408598.719
PROPOSED WELL				
E - 35, WELLCENTER	67° 14' 27.628"	125° 07' 15.766"	7459624.689	408444.337

PLAN AND FIELD NOTES

OF SURVEY OF

PROPOSED EXPLORATORY WELL

APACHE PARAMOUNT LAC MAUNOIR
IN UNIT E, SECTION 35
GRID AREA 67° 20' , 125° 00'

NORTHWEST TERRITORIES
CANADA OIL AND GAS LAND REGULATIONS
EXPLORATORY WELL, NORTHWEST TERRITORIES

SCALE 1:20,000
400m 200 0m 400 800 1200 1600m

SURVEYED FOR
APACHE CANADA LTD.

BY : JOHN E. LANDRY C.L.S., A.L.S
August, 2004.

THIS SURVEY WAS EXECUTED DURING THE PERIOD OF
July 24th to July 27th., 2004.

Certified Correct and completed on the 19th day of August, 2004.

_____ Canada Lands Surveyor

ASSOCIATION OF CANADA LANDS SURVEYORS
John Landry
Comm. No. 1287
ASSOCIATION DES ARPENTEURS DES TERRES DU CANADA

APACHE CANADA LTD.

_____

_____
WITNESS

_____
DATE

LEGEND

UTM coordinates are computed for Zone 10, Central Meridian 123°W. Bearings were derived from differentially corrected GPS Observations, and are referred to meridian 123° W.

Distances are expressed in metres and decimals thereof.
Distances shown in traverse are measured distances reduced to the horizontal at general ground level.
For the computation of coordinates measured distances have been reduced to the UTM plane by multiplying them by an average combined scale factor of 0.9996119.

Distances shown on grid area subdivisions are UTM plane, NAD27 Datum.

Geodetic Survey Control Monument is shown thus.....
Found iron posts are shown thus.....
Spikes placed are shown thus.....
Monuments placed are shown thus.....
Well Center is shown thus.....
Shot Points are shown thus.....
Areas Dealt With shown thus .....
Traverse Lines are shown thus .....
Seismic Lines are shown thus .....
Elevations are shown thus 325.10

Mkr. denotes metal marker post 2.0m long placed 0.3m away from post.

Elevations were derived from G.S.C. "TWEED" No. 699019.
Elev. = 413.70m.
(Geoid Separation: HT2_0)

Survey was completed prior to drilling; therefore well as drilled may not necessarily agree with proposed location.

REV.No.	DESCRIPTION	BY	DATE

JOHN E. LANDRY
CANADA LANDS SURVEYOR

McELHANNEY LAND SURVEYS LTD.
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PH: (780) 451-3420 FAX: (780) 452-7033
McElhanney

Date: Aug.19, 2004		Scale: As Shown
Plan No.: 1 of 1		File No.: 15556WS1
Job No.: 321115556		NB

Plan ID E15556WS1

Appendix B: Corporate Health, Safety & Environment Policy

Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Hydraulic Oil 5606A

Product Use: Hydraulic Oil
Product Number(s): 247707
Company Identification
Chevron Canada Limited
1050 West Pender
Vancouver, BC V6E 3T4
Canada
www.chevronlubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevron.com
Product Information: (800) LUBE TEK

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION: Flammable liquid: Category 4. Aspiration toxicant: Category 1. Acute aquatic toxicant: Category 3. Chronic aquatic toxicant: Category 3.

Signal Word: Danger

Physical Hazards: Combustible liquid (H227).

Health Hazards: May be fatal if swallowed and enters airways (H304).

Environmental Hazards: Harmful to aquatic life with long lasting effects (H412).

PRECAUTIONARY STATEMENTS:
Prevention: Keep away from heat, sparks, open flames and other ignition sources. No smoking (P210). Avoid release to the environment (P273). Wear protective gloves/protective clothing/eye protection/face protection (P280).
Response: IF SWALLOWED: Immediately call a POISON CENTER/doctor (P301+P310). Do NOT induce vomiting (P331). In case of fire: Use media specified in the SDS to extinguish (P370+P378).
Storage: Store locked up (P405). Store in a well-ventilated place (P403).
Disposal: Dispose of contents/container in accordance with applicable local/regional/national/international regulations (P501).

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Distillates, hydrotreated light	64742-47-8	70 - 80 %weight
Highly refined mineral oil (C15 - C50)	Mixture	10 - 20 %weight

Information on ingredients that are considered Controlled Products and/or that appear on the WHMIS Ingredient Disclosure List (IDL) is provided as required by the Canadian Hazardous Products Act (HPA, Sections 13 and 14). Ingredients considered hazardous under the OSHA Hazard Communication Standard, 29 CFR 1910.1200, are also listed. See Section 15 for additional regulatory information.

SECTION 4 FIRST AID MEASURES

Description of first aid measures
Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

Most important symptoms and effects, both acute and delayed
IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Skin contact may cause drying or defatting of the skin. Contact with the skin is not expected to cause an allergic skin response. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected to be harmful to internal organs if absorbed through the skin. High-Pressure Equipment Information: Accidental high-velocity injection under the skin of materials of this type may result in serious injury. Seek medical attention at once should an accident like this occur. The initial wound at the injection site may not appear to be serious at first; but, if left untreated, could result in disfigurement or amputation of the affected part.

Ingestion: Highly toxic; may be fatal if swallowed. Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

Indication of any immediate medical attention and special treatment needed
Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis. In an accident involving high-pressure equipment, this product may be injected under the skin. Such an accident may result in a small, sometimes bloodless, puncture wound. However, because of its driving force, material injected into a fingertip can be deposited into the palm of the hand. Within 24 hours, there is usually a great deal of swelling, discoloration, and intense throbbing pain. Immediate treatment at a surgical emergency center is recommended.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.
Unusual Fire Hazards: Leaks/ruptures in high pressure system using materials of this type can create a fire hazard when in the vicinity of ignition sources (eg. open flame, pilot lights, sparks, or electric arcs). See Section 7 for proper handling and storage.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds

will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Precautionary Measures: Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive force. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 29C (85F).
DO NOT USE IN HIGH PRESSURE SYSTEMS in the vicinity of flames, sparks and hot surfaces. Use only in well ventilated areas. Keep container closed.
Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Wash thoroughly after handling.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Silver Shield, Viton.
Respiratory Protection: No respiratory protection is normally required. Air-Purifying Respirator for Organic Vapors.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge. Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.
Occupational Exposure Limits:

Component	Country/ Agency	TWA	STEL	Ceiling	Notation
Distillates, hydrotreated light	ACGIH	200 mg/m3	--	--	Skin A3
Highly refined mineral oil (C15 - C50)	ACGIH	5 mg/m3	10 mg/m3	--	--

NOTE ON OCCUPATIONAL EXPOSURE LIMITS: Consult local authorities for acceptable provincial values in Canada. Consult the Canadian Standards Association Standard Z94.4-2011 Selection, Use and Care of Respirators.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Red
Physical State: Liquid
Odor: Petroleum odor

Odor Threshold: No data available
pH: Not Applicable
Vapor Pressure: <0.01 mmHg (Estimated) @ 37.8 °C (100 °F)
Vapor Density (Air = 1): >4
Initial Boiling Point: 207.2°C (405°F)
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: Not Applicable
Melting Point: No data available
Specific Gravity: 0.86 - 0.90 @ 15°C (59°F)
Density: 0.86 kg/l - 0.90 kg/l @ 15°C (59°F)
Viscosity: 13.20 mm2/s @ 40°C (104°F) Minimum
Coefficient of Therm. Expansion / °F: Not Applicable
Evaporation Rate: No data available
Decomposition temperature: No data available
Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:
Flammability (solid, gas): No Data Available

Flashpoint: (Cleveland Open Cup) 80 °C (176 °F) Minimum
Autoignition: No data available
Flammability (Explosive) Limits (% by volume in air): Lower: Not Applicable Upper: Not Applicable

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: Not applicable
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.
Sensitivity to Mechanical Impact: No.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects
Serious Eye Damage/Irritation: The eye irritation hazard is based on evaluation of data for product components.

Skin Corrosion/Irritation: The skin irritation hazard is based on evaluation of data for product components.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for product components.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for product components.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for product components.For additional information on the acute toxicity of the components, call the technical information center.
Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The hazard evaluation is based on data for components or a similar material.

Carcinogenicity: The hazard evaluation is based on data for components or a similar material.

Reproductive Toxicity: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Single Exposure: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Repeated Exposure: The hazard evaluation is based on data for components or a similar material.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

These oils have not been classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as: confirmed human carcinogen (A1), suspected human carcinogen (A2), or confirmed animal carcinogen with unknown relevance to humans (A3).

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

This material is expected to be harmful to aquatic organisms and may cause long-term adverse effects in the aquatic environment.
The product has not been tested. The statement has been derived from the properties of the individual components.

MOBILITY

No data available.

PERSISTENCE AND DEGRADABILITY

This material is not expected to be readily biodegradable. The product has not been tested. The statement

has been derived from the properties of the individual components.

POTENTIAL TO BIOACCUMULATE
Bioconcentration Factor: No data available.
Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods. (See B.C. Reg. GY/92 Waste Management Act; R.R.O. 1990, Reg. 347 General-Waste Management; C.C.SM.c. W40 The Waste Reduction and Prevention Act; N.S. Reg. 51/95 and N.S. Reg. 179/96 for examples of Provincial legislation.)

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

TC Shipping Description: NOT REGULATED AS DANGEROUS GOODS UNDER TRANSPORT CANADA

IMO/IMDG Shipping Description: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER THE IMDG CODE

ICAO/IATA Shipping Description: NOT REGULATED AS DANGEROUS GOODS UNDER THE ICAO TI / IATA DGR CODE

DOT Shipping Description: UN1268, PETROLEUM PRODUCTS, N.O.S., COMBUSTIBLE LIQUID, III ; ADDITIONAL INFORMATION: NON-BULK PACKAGES ARE NOT REGULATED IN THE USA. SEE 173.150 (F) FOR SPECIAL PROVISIONS FOR VESSEL AND AIRCRAFT

SECTION 15 REGULATORY INFORMATION

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1	03=EPCRA 313
01-2A=IARC Group 2A	04=CA Proposition 65
01-2B=IARC Group 2B	05=MA RTK
02=NTP Carcinogen	06=NJ RTK
	07=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

SECTION 16 OTHER INFORMATION

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1-16
Revision Date: FEBRUARY 11, 2016

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
GHS - Globally Harmonized System	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
WHMIS - Workplace Hazardous Materials Information System	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration
NCEL - New Chemical Exposure Limit	EPA - Environmental Protection Agency
SCBA - Self-Contained Breathing Apparatus	

Prepared according to WHMIS 2015 by Chevron Energy Technology Company, 6001 Bollinger Canyon Road San Ramon, CA 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

SAFETY DATA SHEET

SECTION 1 IDENTIFICATION

PRODUCT

Product Name: **COMMERCIAL PROPANE (ODORIZED)**
Product Description: Liquefied Hydrocarbon Gas, Gas or Liquefied Gas
SDS Number: 8515

Intended Use: Fuel gas

COMPANY IDENTIFICATION

Supplier: **Imperial Oil Downstream**
P.O. Box 2480, Station M
Calgary, ALBERTA T2P 3M9 Canada

24 Hour Emergency Telephone	1-866-232-9563
Transportation Emergency Phone Number	1-866-232-9563
Product Technical Information	1-800-268-3183
Supplier General Contact	1-800-567-3776

SECTION 2 HAZARD IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines.

This product has been classified in accordance with hazard criteria of the Hazardous Products Regulations (HPR) SOR/2015-17 and the SDS contains all the information required by the HPR SOR/2015-17.

CLASSIFICATION:

Flammable Gases — Category 1
Gases Under Pressure — Liquefied Gas
Simple Asphyxiants — Category 1

LABEL:
Pictogram:

Signal Word: Danger

Hazard Statements:
H220: Extremely flammable gas. H280: Contains gas under pressure; may explode if heated.

May displace oxygen and cause rapid suffocation.

Precautionary Statements:
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P273: Avoid release to the environment.P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381: In case of leakage, eliminate all ignition sources.P410 + P403: Protect from sunlight. Store in a well-ventilated place.P501: Dispose of contents and container in accordance with local regulations.

Other hazard information:

Health Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

Physical Hazards Not Otherwise Classified: None as defined under HPR SOR/2015-17.

PHYSICAL / CHEMICAL HAZARDS

Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling. Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Frostbite hazard - rapidly expanding gas or liquid may cause frostbite. Material can accumulate static charges which may cause an ignition. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited.

HEALTH HAZARDS

High-pressure injection under skin may cause serious damage. Continued exposure to odorised gas may reduce or eliminate ability to smell the odorant. People with impaired ability to detect odour due to colds, allergies, injuries etc must be especially cautious. Odour must not be used exclusively as a safety measure. Proper respiratory protection and fire/explosion precautions should be utilised when odour is first detected. Exposure to concentrations above 10% of the LEL may cause a general central nervous system (CNS) depression typical of anesthetic gases or intoxicants. Excessive exposure may result in eye, skin, or respiratory irritation.

ENVIRONMENTAL HAZARDS

Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

NFPA Hazard ID:	Health:	1	Flammability:	4	Reactivity:	0
HMIS Hazard ID:	Health:	1	Flammability:	4	Reactivity:	0

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a mixture.

Hazardous Substance(s) or Complex Substance(s) in Hazardous product

Name	CAS#	Concentration*	GHS Hazard Codes

ALKANES, C4	68513-65-5	0 - 2.5%	H220
ETHANE	74-84-0	0 - 5%	H220, H280, H402
ETHYL MERCAPTAN	75-08-1	0.5%	H225, H332, H400(M factor 1), H410(M factor 1)
ISOBUTANE	75-28-5	0 - 2.5%	H220, H280
PROPANE	74-98-6	90 - 99%	H220, H280
PROPYLENE	115-07-1	1 - 10%	H220, H280, H402

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 4 FIRST-AID MEASURES

INHALATION

Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device.

SKIN CONTACT

If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury. If frostbite occurs, immerse involved area in water at body temperature. Keep immersed for 20 to 40 minutes. Seek medical assistance.

EYE CONTACT

Flush thoroughly with water for at least 15 minutes. Get medical assistance.

INGESTION

Not Applicable

NOTE TO PHYSICIAN

This material, or a component, may be associated with cardiac sensitization following very high exposures (well above occupational exposure limits) or with concurrent exposure to high stress levels or heart-stimulating substances like epinephrine. Administration of such substances should be avoided.

SECTION 5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, dry chemical or carbon dioxide (CO_2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Allow the fire to burn under controlled conditions. Stop leak if you can do so without risk. Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapours and to protect personnel attempting to stop a leak. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Flammable Gas. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

Hazardous Combustion Products: Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: -103°C (-153°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 2.4 UEL: 9.5
Autoignition Temperature: 432°C (810°F)

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

For emergency responders: Respiratory protection: half-face or full-face respirator with filter(s) for organic vapor or Self Contained Breathing Apparatus (SCBA) can be used depending on the size of the spill and potential level of exposure. If the exposure cannot be completely characterized or an oxygen deficient atmosphere is possible or anticipated, SCBA is recommended. Work gloves that provide chemical resistance and, when necessary, heat-resistance and/or thermal insulation are recommended. Note: gloves made of polyvinyl acetate (PVA) are not water-resistant and are not suitable for emergency use. Small spills: normal work clothes are usually adequate. Large spills: full body suit of chemical and thermal resistant material is recommended. Chemical goggles and face shield are recommended if contact with liquefied gas is possible.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning. Allow liquid to evaporate from the surface. All equipment used when handling the product must be grounded. Do not direct water at spill or source of leak. Do not touch or walk through spilled material. If possible, turn leaking containers so that gas escapes rather than liquid. Isolate area until gas has dispersed. Prevent spreading of vapour through sewers, ventilation systems and confined areas. Use water spray to reduce vapour or divert vapour cloud drift. Avoid allowing water run-off to contact spilled material.

Water Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Allow liquid to evaporate from the surface. See Land Spill section of the SDS for advice on gases.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction

and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Ethyl mercaptan is added to gas as an odorant to aid in the detection of the gas in case of leak or accidental discharge. Since ethyl mercaptan is reactive, a reduction in its effectiveness may occur during transport and storage of the odorised gas. Therefore, odour must not be used exclusively as a safety measure. Handle gas with strict adherence to established safety procedures. Use proper bonding and/or earthing procedures.However, bonding and earthing may not eliminate the hazard from static accumulation. Material can accumulate static charges which may cause an electrical spark (ignition source).

Static Accumulator: This material is a static accumulator.

STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. The type of container used to store the material may affect static accumulation and dissipation. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage containers should be earthed and bonded.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT VALUES

Substance Name	Form	Limit/Standard			Note	Source
ETHYL MERCAPTAN		TWA	0.5 ppm			ACGIH
ISOBUTANE		STEL	1000 ppm			ACGIH
PROPYLENE		TWA	500 ppm			ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use

with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Thermally protective, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet-style gloves.

Eye Protection: Face shield is recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

Thermally protective and chemical resistant apron and long sleeves are recommended when volume of material is significant.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Gas
Form: Liquefied
Colour: Colourless
Odour: Mercaptan
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.51
Flammability (Solid, Gas): Flammable - Category 1
Flash Point [Method]: -103°C (-153°F) [ASTM D-92]
Flammable Limits (Approximate volume % in air): LEL: 2.4 UEL: 9.5
Autoignition Temperature: 432°C (810°F)
Boiling Point / Range: -42°C (-44°F)
Decomposition Temperature: N/D
Vapour Density (Air = 1): 1.5 at 101 kPa
Vapour Pressure: 850 kPa (6375 mm Hg) at 20ºC
Evaporation Rate (n-butyl acetate = 1): > 1
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): N/A
Solubility in Water: Negligible
Viscosity: [N/D at 40°C] | 0.5 cSt (0.5 mm2/sec) at 15°C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: >-187°C (-305°F)

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

POSSIBILITY OF HAZARDOUS REACTIONS: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Hazard Class	Conclusion / Remarks
Inhalation	
Acute Toxicity: (Rat) 15 minute(s) LC50 1443 mg/l	Minimally Toxic. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 403
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Acute Toxicity: No end point data for material.	Not applicable.
Skin	
Acute Toxicity: No end point data for material.	Not applicable.
Skin Corrosion/Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures.

Eye	
Serious Eye Damage/Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes.
Sensitisation	
Respiratory Sensitization: No end point data for material.	Not expected to be a respiratory sensitizer.
Skin Sensitization: No end point data for material.	Not expected to be a skin sensitizer.
Aspiration: No end point data for material.	Not expected to be an aspiration hazard. Based on physico-chemical properties of the material.
Germ Cell Mutagenicity: Data available.	Not expected to be a germ cell mutagen. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 471 473 474
Carcinogenicity: No end point data for material.	Not expected to cause cancer.
Reproductive Toxicity: Data available.	Not expected to be a reproductive toxicant. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 422
Lactation: No end point data for material.	Not expected to cause harm to breast-fed children.
Specific Target Organ Toxicity (STOT)	
Single Exposure: No end point data for material.	Not expected to cause organ damage from a single exposure.
Repeated Exposure: Data available.	Not expected to cause organ damage from prolonged or repeated exposure. Based on test data for structurally similar materials. Test(s) equivalent or similar to OECD Guideline 412 413 422

TOXICITY FOR SUBSTANCES

NAME	ACUTE TOXICITY
ETHYL MERCAPTAN	Dermal Lethality: LD50 > 2000 mg/kg (Rat); Inhalation Lethality: 4 hour(s) LC50 > 2.52 mg/l (Vapour) (Rat); Oral Lethality: LD 50 682 mg/kg (Rat)

OTHER INFORMATION

For the product itself:

May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion and blurred vision) and/or damage. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite (cold burn). Exposure to this material, or one of its components, in situations where there is the potential for high levels, such as in confined spaces or with abuse, may result in abnormal heart rhythm (arrhythmia). High-level exposure to hydrocarbons (above occupational exposure limits) may initiate arrhythmia in a worker that is undergoing stress or is taking a heart-stimulating substance such as epinephrine, a nasal decongestant, or an asthma or cardiovascular drug. Simple asphyxiant: Acts by displacing oxygen in the lungs thereby diminishing the supply of oxygen available to the blood and tissues. Symptoms include shortness of breath, rapid heart rate, incoordination, lethargy, headaches, nausea, vomiting, and disorientation. Continued lack of oxygen may result in convulsions, loss of consciousness and death. Since exercise increases the tissue need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment. Oxygen in enclosed spaces should be maintained at 21 percent by volume.

CMR Status: None.

Chemical Name	CAS Number	List Citations
ISOBUTANE	75-28-5	4
PROPYLENE	115-07-1	4

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A
3 = IARC 2B
4 = ACGIH ALL
5 = ACGIH A1
6 = ACGIH A2

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

MOBILITY

Material -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to be inherently biodegradable

Atmospheric Oxidation:

Material -- Expected to degrade at a moderate rate in air

BIOACCUMULATION POTENTIAL

Material -- Potential to bioaccumulate is low.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

REGULATORY DISPOSAL INFORMATION

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (TDG)

Proper Shipping Name: LIQUEFIED PETROLEUM GASES
Hazard Class & Division: 2.1
UN Number: 1075
Packing Group: (N/A)

LAND (DOT)

Proper Shipping Name: PETROLEUM GASES, LIQUEFIED
Hazard Class & Division: 2.1
ID Number: 1075
Packing Group: (N/A)
ERG Number: 115
Label(s): 2.1
Transport Document Name: UN1075, PETROLEUM GASES, LIQUEFIED, 2.1

SEA (IMDG)

Proper Shipping Name: PETROLEUM GASES, LIQUEFIED
Hazard Class & Division: 2.1
EMS Number: F-D, S-U
UN Number: 1075
Packing Group: (N/A)
Marine Pollutant: No
Label(s): 2.1
Transport Document Name: UN1075, PETROLEUM GASES, LIQUEFIED, 2.1 (-103°C c.c.)

AIR (IATA)

Proper Shipping Name: PETROLEUM GASES, LIQUEFIED
Hazard Class & Division: 2.1
UN Number: 1075
Packing Group: (N/A)
Label(s) / Mark(s): 2.1
Transportation Limitations: CARGO AIRCRAFT ONLY
Transport Document Name: UN1075, PETROLEUM GASES, LIQUEFIED, 2.1

SECTION 15 REGULATORY INFORMATION

WHMIS Classification: Class A: Compressed Gas Class B, Division 1: Flammable Gases

CEPA: All components of this product are either on the Domestic Substance List (DSL) or are exempt.

Listed or exempt from listing/notification on the following chemical inventories: AICS, DSL, ENCS, IECSC, KECI, PICCS, TSCA

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
ISOBUTANE	75-28-5	6
PROPANE	74-98-6	6
PROPYLENE	115-07-1	6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2
3 = TSCA 5e
4 = TSCA 6
5 = TSCA 12b
6 = NPRI

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

KEY TO THE H-CODES CONTAINED IN SECTION 3 OF THIS DOCUMENT (for information only):
H220: Extremely flammable gas; Flammable Gas, Cat 1
H225: Highly flammable liquid and vapor; Flammable Liquid, Cat 2
H280: Contains gas under pressure; may explode if heated; Pressurized Gas
H332: Harmful if inhaled; Acute Tox Inh, Cat 4
H400: Very toxic to aquatic life; Acute Env Tox, Cat 1
H402: Harmful to aquatic life; Acute Env Tox, Cat 3
H410: Very toxic to aquatic life with long lasting effects; Chronic Env Tox, Cat 1

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Updates made in accordance with implementation of GHS requirements.

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DGN: 5007473 (1010550)

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SECTION 1. IDENTIFICATION

Product name	:	DIESEL FUEL
Synonyms	:	Seasonal Diesel, #1 Diesel, #2 Heating Oil, #1 Heating Oil, D50, 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, Marine Gas Oil Dyed.
Product code	:	102907, 102762, 102763, 102755, 102302, 102744, 101801, 100678, 100677, 101802, 100107, 100668, 100658, 100911, 100663, 100652, 100460, 100065, 101796, 101793, 101795, 101792, 101794, 101791, 100768, 100643, 100642, 100103, 101798, 101800, 101797, 101788, 101789, 101787, 102531, 100734, 100733, 100640, 100997, 100995, 100732, 100731, 100994
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; Canutec Transportation: 1-888-226-8832 (toll-free) or 613-996-6666; Poison Control Centre: Consult local telephone directory for emergency number(s).

Recommended use of the chemical and restrictions on use

Recommended use	:	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.
Prepared by	:	Product Safety: +1 905-804-4752

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance	Bright oily liquid.
Colour	Clear to yellow (This product may be dyed red for taxation purposes)
Odour	Mild petroleum oil like.

GHS Classification

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Flammable liquids	:	Category 3
Acute toxicity (Inhalation)	:	Category 4
Skin irritation	:	Category 2
Carcinogenicity	:	Category 2
Specific target organ toxicity - single exposure	:	Category 3 (Central nervous system)
Specific target organ toxicity - repeated exposure	:	Category 2 (Liver, thymus, Bone)
Aspiration hazard	:	Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Flammable liquid and vapour.
May be fatal if swallowed and enters airways.
Causes skin irritation.
Harmful if inhaled.
May cause drowsiness or dizziness.
Suspected of causing cancer.
May cause damage to organs (Liver, thymus, Bone) through prolonged or repeated exposure.

Precautionary statements : **Prevention:**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Keep container tightly closed.
Ground and bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting equipment.
Use non-sparking tools.
Take action to prevent static discharges.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF SWALLOWED: Immediately call a POISON CENTER/doctor.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.

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IF exposed or concerned: Get medical advice/ attention.
Do NOT induce vomiting.
If skin irritation occurs: Get medical advice/ attention.
Take off contaminated clothing and wash it before reuse.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Storage:
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.

Potential Health Effects

Primary Routes of Entry	:	Eye contact Ingestion Inhalation Skin contact Skin Absorption
Target Organs	:	Skin Eyes Respiratory Tract
Inhalation	:	May cause respiratory tract irritation. 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	:	Causes skin irritation.
Eyes	:	Causes eye irritation.
Ingestion	:	Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Aspiration hazard if swallowed - can enter lungs and cause damage.
Aggravated Medical Condition	:	None known.

Other hazards

None known.

IARC	No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH	Confirmed animal carcinogen with unknown relevance to humans

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SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration
fuels, diesel	68334-30-5	70 - 100 %
kerosine (petroleum)	8008-20-6	
kerosine (petroleum), hydrodesulfurized	64742-81-0	
Alkanes, C10-20-branched and linear	928771-01-1	0 - 25 %
Soybean oil, Methyl ester	67784-80-9	0 - 5 %
Rape oil, Methyl ester	73891-99-3	
Fatty acids, tallow, Methyl esters	61788-61-2	

SECTION 4. FIRST AID MEASURES

If inhaled : Move to fresh air.
Artificial respiration and/or oxygen may be necessary.
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 : None known.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

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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 fire-fighting	:	Cool closed containers exposed to fire with water spray.
Hazardous combustion products	:	Carbon oxides (CO, CO2), nitrogen oxides (NOx), sulphur oxides (SOx), sulphur compounds (H2S), smoke and irritating vapours as products of incomplete combustion.
Further information	:	Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.

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.

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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
kerosine (petroleum), hydrodesulfurized	64742-81-0	TWA	200 mg/m3 (As total hydrocarbon vapour)	ACGIH
		TWA	200 mg/m3 (As total hydrocarbon vapour)	ACGIH
kerosine (petroleum)	8008-20-6	TWA	200 mg/m3 (total hydrocarbon vapor)	CA BC OEL
		TWA	200 mg/m3 (total hydrocarbon vapor)	CA AB OEL
		TWA	200 mg/m3 (total hydrocarbon vapor)	ACGIH

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 : 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.

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Hand protection		
Material	:	neoprene, nitrile, 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	:	Bright oily liquid.
Colour	:	Clear to yellow (This product may be dyed red for taxation purposes)
Odour	:	Mild petroleum oil like.
Odour Threshold	:	No data available
pH	:	No data available
Pour point	:	No data available
Boiling point/boiling range	:	150 - 371 °C (302 - 700 °F)
Flash point	:	> 40 °C (104 °F) Method: closed cup
Auto-Ignition Temperature	:	225 °C (437 °F)
Evaporation rate	:	No data available
Flammability	:	Flammable in presence of open flames, sparks and heat. Va-

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		pours are heavier than air and may travel considerable distance to sources of ignition and flash back. This product can accumulate static charge and ignite.
Upper explosion limit	:	6 %(V)
Lower explosion limit	:	0.7 %(V)
Vapour pressure	:	7.5 mmHg (20 °C / 68 °F)
Relative vapour density	:	4.5
Relative density	:	0.8 - 0.88
Solubility(ies)		
Water solubility	:	insoluble
Partition coefficient: n-octanol/water	:	No data available
Viscosity		
Viscosity, kinematic	:	1.3 - 4.1 cSt (40 °C / 104 °F)
Explosive properties	:	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.

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 and acids.
Hazardous decomposition products	:	May release COx, NOx, SOx, H2S, smoke and irritating vapours when heated to decomposition.

SECTION 11. TOXICOLOGICAL INFORMATION

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

Acute toxicity

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Product:

Acute oral toxicity	:	Remarks: No data available
Acute inhalation toxicity	:	Remarks: No data available
Acute dermal toxicity	:	Assessment: The substance or mixture has no acute dermal toxicity Remarks: No data available

Components:

fuels, diesel:

Acute oral toxicity	:	LD50 (Rat): 7,500 mg/kg,
Acute dermal toxicity	:	LD50 (Mouse): 24,500 mg/kg,

kerosine (petroleum):

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg,
Acute inhalation toxicity	:	LC50 (Rat): > 5 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg,

kerosine (petroleum), hydrodesulfurized:

Acute oral toxicity	:	LD50 (Rat): > 5,000 mg/kg,
Acute inhalation toxicity	:	LC50 (Rat): > 5.2 mg/l Exposure time: 4 hrs Test atmosphere: dust/mist
Acute dermal toxicity	:	LD50 (Rabbit): > 2,000 mg/kg,

Skin corrosion/irritation

Product:

Remarks: No data available

Serious eye damage/eye irritation

Product:

Remarks: No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

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No data available

Reproductive toxicity

No data available

STOT - single exposure

No data available

STOT - repeated exposure

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.

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		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 Regulations

IATA-DGR

UN/ID No.	:	UN 1202
Proper shipping name	:	Diesel fuel
Class	:	3
Packing group	:	III
Labels	:	Class 3 - Flammable Liquid
Packing instruction (cargo aircraft)	:	366

IMDG-Code

UN number	:	UN 1202
Proper shipping name	:	DIESEL FUEL
Class	:	3
Packing group	:	III
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

National Regulations

TDG

UN number	:	UN 1202
Proper shipping name	:	DIESEL FUEL
Class	:	3
Packing group	:	III
Labels	:	3
ERG Code	:	128
Marine pollutant	:	no

SECTION 15. REGULATORY INFORMATION

This product has been classified according to the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all of the information required by the HPR.

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

DSL On the inventory, or in compliance with the inventory

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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 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
Revision Date	:	2018/09/12

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.

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SAFETY DATA SHEET

SDS00349
ETHYLENE GLYCOL

Preparation Date: 26/Jan/2018 Version: 2

1. IDENTIFICATION

Product identifier

Product Name ETHYLENE GLYCOL

Other means of identification

Product Code(s) SDS00349

Synonyms none

Recommended use of the chemical and restrictions on use

Recommended Use Used as antifreeze, heat transfer fluid, solvent, and raw material in polyester fiber manufacturing.

Restricted Uses No information available

Initial Supplier Identifier
Univar Canada Ltd.
9800 Van Horne Way
Richmond, BC V6X 1W5
Telephone: 1-866-686-4827

Emergency telephone number

24 Hour Emergency Phone Number (CANUTEC): 1-888-226-8832 (1-888-CAN-UTEC)

2. HAZARD IDENTIFICATION

Hazardous Classification of the substance or mixture

Acute toxicity - Oral	Category 4
Specific target organ toxicity (repeated exposure)	Category 2

Label elements

Hazard pictograms

Signal Word: Warning

Hazard statements
Harmful if swallowed
May cause damage to organs through prolonged or repeated exposure

Precautionary Statements

Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not breathe dust/fume/gas/mist/vapors/spray

Response
Specific treatment (see first aid instructions on label)
IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
Rinse mouth

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

Disposal
Dispose of contents/container to an approved waste disposal plant

Unknown acute toxicity No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Chemical Name	CAS No	Weight-%	Synonyms
Ethylene Glycol	107-21-1	90 - 100%	Ethylene Glycol

4. FIRST AID

Description of first aid measures

General advice
Show this safety data sheet to the doctor in attendance.

Inhalation
Remove to fresh air.

Eye contact
Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

Skin contact
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

Ingestion
Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Call a physician.

Most important symptoms and effects, both acute and delayed:
Corneal injury is unlikely. At room temperature, exposure to vapor is minimal due to low volatility. With good ventilation, single exposure is not expected to cause adverse effects. If material is heated or areas are poorly ventilated, vapor/mist may accumulate and cause respiratory irritation and symptoms such as headache and nausea. Repeated skin exposure to large quantities may result in absorption of harmful amounts. Massive contact with damaged skin or if material sufficiently hot to burn skin may result in absorption of potential lethal amounts. Vapors or mists may cause eye irritation. May cause slight eye irritation May be fatal if swallowed Cardiac failure, pulmonary edema, and severe kidney damage may develop. Prolonged contact may cause skin irritation with local redness. Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Swallowing may result in severe effects, even death. The lethal dose in adult humans for ethylene glycol is approximately 3 ounces (100 ml) (1/3 cup). May cause nausea or vomiting. May cause abdominal discomfort or diarrhea. Brief contact is essentially non-irritating to skin.

Indication of any immediate medical attention and special treatment needed:

Note to physicians
It is estimated that the oral dose to adults is of the order of 1.0 ml/kg. Ethylene glycol is metabolized by alcohol dehydrogenate to various metabolites including glyceraldehydes, glycolic acid and oxalic acid which cause an elevated anion-gap metabolic acidosis and renal tubular injury. The signs and symptoms in ethylene glycol poisoning are those of metabolic acidosis, CNS depression and kidney injury. Urinalysis may show albuminuria, hematuria and oxaluria. Clinical chemistry may reveal anion-gap metabolic acidosis and uremia. The currently recommended medical management of ethylene glycol poisoning includes elimination of ethylene glycol and metabolites, correction of metabolic acidosis and prevention of kidney injury. It is essential to have immediate and follow up urinalysis and clinical chemistry. There should be particular emphasis on acid-base balance and renal function tests. A continuous infusion of 5% sodium bicarbonate with frequent monitoring of electrolytes and fluid balance is used to achieve correction of metabolic acidosis and forced diuresis. As a competitive substrate for alcohol dehydrogenase, ethanol is antidotal. Given in the early stages of intoxication, it blocks the formulation of nephrotoxic metabolites. A therapeutically effective blood concentration of ethanol is in the range 100 - 150 mg/dl and should be achieved by a rapid loading dose and maintained by intravenous infusion. For severe and /or deteriorating cases, hemodialysis may be required. Dialysis should be considered for patients who are symptomatic, have severe metabolic acidosis, a blood ethylene glycol concentration greater than 25 mg/dl, or compromise of renal functions.

A more effective intravenous antidote for physician use in 4-methylpyrazole, a potent inhibitor of alcohol dehydrogenases which effectively blocks the formation of toxic metabolites of ethylene glycol. It has been used to decrease the metabolic consequences of ethylene glycol poisoning before metabolic acidosis coma, seizures and renal failure have occurred. A generally recommended protocol is a loading dose of 15 mg/kg followed by 10 mg/kg every 12 hours for 4 doses and the 15 mg/kg every 12 hours until the ethylene glycol concentrations are below 20 mg/100ml.Slow intravenous infusion is required. Since 4-methylpyrazole is dialyzable, increased dosage may be necessary during hemodialysis. Additional therapeutic measures may include the administration of cofactors involved in the metabolism of ethylene glycol. Thiamine (100 mg) and pyridoxine (50 mg) should be given every six hours.

Pulmonary edema with hypoxemia has been described in a number of patients following poisoning with ethylene glycol. The mechanism of production has not been elucidated, but it appears to be non-cardiogenic in origin in several cases. Respiratory support with mechanical ventilation and positive end expiratory pressure may be required. There may be cranial nerve involvement in the late stages of toxicity from swallowed ethylene glycol. In particular, effects have been reported involving the seventh, eighth and ninth cranial nerves, presenting with bilateral facial paralysis, diminished hearing, and dysphagia.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Water fog or fine spray, carbon dioxide, dry chemical, foam. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effectively. Do not use direct water stream, which will spread fire.

Specific hazards arising from the substance or mixture
Use water spray to cool fire-exposed containers and structures. Isolate and restrict area access. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Container may rupture from gas generation in a fire situation. Fight fire from a safe distance and from a protected location. Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity. Consider use of unmanned hose holder or monitor nozzles.

Hazardous combustion products
Hazardous decomposition products depend upon temperature, air supply, and the presence of other materials. Hazardous decomposition products may include and are not limited to : aldehydes, ketones, organic acids.

Special protective equipment for fire-fighters
Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation.

Environmental precautions

See Section 12 for additional Ecological Information.

Methods and materials for containment and cleaning up

Prevent further leakage or spillage if safe to do so.

7. HANDLING AND STORAGE

Precautions for safe handling

For industrial use only. Handle and open containers with care. Avoid contact with eyes, skin and clothing. Do not ingest. Avoid inhalation of chemical. Empty containers may contain hazardous product residues. Keep the containers closed when not in use. Protect against physical damage. Use appropriate personnel protective equipment. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion. Do not consume food, drink or smoke while handling this material.

Conditions for safe storage, including any incompatibilities

Avoid storage with incompatible materials. Keep containers tightly closed. Keep in a cool, well-ventilated place. Do not store near food, foodstuffs, drugs or potable water supplies.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Limits .

Chemical Name	Alberta OEL	British Columbia OEL	Ontario	Quebec OEL	Exposure Limit - ACGIH	Immediately Dangerous to Life or Health - IDLH
Ethylene Glycol 107-21-1	Ceiling: 100 mg/m^3	TWA: 10 mg/m^3 STEL: 20 mg/m^3 Ceiling: 100 mg/m^3 Ceiling: 50 ppm	CEV: 100 mg/m^3	Ceiling: 50 ppm Ceiling: 127 mg/m^3	50 ppm STEL 10 mg/m^3 STEL 25 ppm TLV-TWA	Not available

Consult local authorities for recommended exposure limits

Appropriate engineering controls

Engineering controls
General (mechanical) room ventilation is expected to be satisfactory. Local ventilation recommended where mechanical ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit.

Individual protection measures, such as personal protective equipment

Eye/face protection
Chemical goggles; also wear a face shield if splashing hazard exists.

Hand protection
Use gloves chemically resistant to this material, examples of preferred glove barrier materials include:. Butyl rubber gloves. Nitrile gloves. Neoprene gloves. Polyvinyl alcohol gloves. Ethyl Vinyl Alcohol Laminate (EVAL). Natural rubber gloves. Polyvinylchloride (PVC) gloves. Polyethylene gloves. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials as well as the instructions/specifications provided by the glove supplier.

Skin and body protection
Skin contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance. Chemical apron. Boots. When handling hot material, protect skin from thermal burns as well as from skin absorption.

Respiratory protection
Atmospheric levels should be maintained below the exposure guideline. For most conditions, no respiratory protection is needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator.

General hygiene considerations
Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance

Physical state	Liquid
Color	Colorless
Odor	Sweet
Odor threshold	No information available

PROPERTIES	Values	Remarks • Method
pH	9	
Melting point / freezing point	-13 °C / 9 °F	
Initial boiling point/boiling range	No data available	None known

Flash point	111 °C / 232 °F	Closed cup.
Evaporation rate	0.01	
Flammability (solid, gas)	No data available	None known
Flammability Limit in Air		
Upper flammability limit:	15.3	
Lower flammability limit:	3.2	
Vapor pressure	0.06 mmHg @ 20°C	
Relative vapor density	2.1	
Specific Gravity	1.115 @ 20°C	
Water solubility	1000 (RBT)	
Solubility in other solvents	No data available	
Partition coefficient	No data available	
Autoignition temperature	427 °C / 801 °F	
Decomposition temperature	No data available	None known
Kinematic viscosity	Dynamic Viscosity: 19.83 mPa.s @ 20°C	
Dynamic viscosity	No data available	None known
Explosive properties	No information available.	
Oxidizing properties	No information available.	
Molecular weight	62 g/mol	
VOC Percentage Volatility	No information available	
Liquid Density	No information available	
Bulk density	No information available	

10. STABILITY AND REACTIVITY

Reactivity/Chemical Stability
Stable

Possibility of hazardous reactions
No additional remark.

Hazardous polymerization
Will not occur.

Conditions to avoid
Avoid excessive heat, open flames and all ignition sources. Product can decompose at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible materials
Strong oxidizers. Strong acids and bases.

Hazardous decomposition products
Hazardous decomposition products depend upon temperature, air supply, and the presence of other materials. Hazardous decomposition products may include and are not limited to : aldehydes, ketones, organic acids.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation
At room temperature, exposure to vapor is minimal due to low volatility. With good ventilation, single exposure is not expected to cause adverse effects. If material is heated or areas are poorly ventilated, vapor/mist may accumulate and cause respiratory irritation and symptoms such as headache and nausea.

Eye contact

Corneal injury is unlikely. Vapors or mists may cause eye irritation. May cause slight eye irritation.

Skin contact
Repeated skin exposure to large quantities may result in absorption of harmful amounts. Massive contact with damaged skin or if material sufficiently hot to burn skin may result in absorption of potential lethal amounts. Prolonged contact may cause skin irritation with local redness. Brief contact is essentially non-irritating to skin.

Ingestion
May be fatal if swallowed. Cardiac failure, pulmonary edema, and severe kidney damage may develop. Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. Swallowing may result in severe effects, even death. The lethal dose in adult humans for ethylene glycol is approximately 3 ounces (100 ml) (1/3 cup). May cause nausea or vomiting. May cause abdominal discomfort or diarrhea.

Information on toxicological effects

Symptoms
Repeated skin contact with ethylene glycol may, in a very small proportion of cases, cause sensitization with the development of allergic contact dermatitis. The incidence is significantly less than 1% with the undiluted material. Repeated inhalation of ethylene glycol may produce signs of central nervous system involvement, particularly dizziness and nystagmus (involuntary eye movement). Exposure may place individuals with existing heart problems at added risk of potential cardiac irregularities and heart failure. In animals , effects have been reported on the following organs: Kidney, liver.

Numerical measures of toxicity

Acute toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral) 505.00 mg/kg
ATEmix (dermal) 10,707.00 mg/kg

Unknown acute toxicity No information available

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Ethylene Glycol 107-21-1	= 4700 mg/kg (Rat)	= 10600 mg/kg (Rat)	Not available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation
Repeated skin exposure to large quantities may result in absorption of harmful amounts. Massive contact with damaged skin or if material sufficiently hot to burn skin may result in absorption of potential lethal amounts. Prolonged contact may cause skin irritation with local redness. Brief contact is essentially non-irritating to skin.

Serious eye damage/eye irritation
Corneal injury is unlikely. Vapors or mists may cause eye irritation. May cause slight eye irritation.

Respiratory or skin sensitization
No information available.

Germ cell mutagenicity
No information available.

Carcinogenicity
No information available.

Chemical Name	ACGIH	IARC	NTP	OSHA
Ethylene Glycol 107-21-1	Not available	Not available	Not available	Not available

Reproductive toxicity
Based on animal studies, ingestion of very large amounts of ethylene glycol appears to be the major and possibly only route of exposure to produce birth defects. Exposures by inhalation or skin contact, the primary routes of occupational exposure, had minimal effect on the fetus, in animal studies. Ingestion of large amounts of ethylene glycol has been shown to interfere with reproduction in animals. Specifically, growth retardation and decreased litter size in rats and mice and decreased mating frequency in mice were observed. Ethylene glycol has been shown to produce dose-related teratogenic effects in rats and mice when given by gavage or in drinking water at high concentrations or doses. The no-effect doses for developmental toxicity for ethylene glycol given by gavage over the period of organogenesis has been shown to be 150 mg/kg/day for the mouse and 500 mg/kg/day for the rat. Also, in a preliminary study to assess the effects of exposure of pregnant rats and mice to aerosols at concentrations of 150, 1000 and 2500 mg/m^3 for 6 hours a day throughout the period of organogenesis, teratogenic effects were produced at the highest concentration, but only in mice. The conditions of these latter experiments did not allow a conclusion as to whether the developmental toxicity was mediated by inhalation of aerosol, percutaneous absorption of ethylene glycol from contaminated skin, or swallowing of ethylene glycol as a result of grooming the wetted coat. In a further study, comparing effects from high aerosol concentration by whole-body or nose-only exposure, it was shown that nose-only exposure resulted in maternal toxicity (1000 and 2500 mg/m^3) and developmental toxicity with minimal evidence of teratogenicity (2500 mg/m^3). The no-effects concentration (based on maternal toxicity) was 500 mg/m^3. In a further study in mice, no teratogenic effects could be produced when ethylene glycol was applied to the skin of pregnant mice over the period of organogenesis. The above observations suggest that ethylene glycol is to be regarded as an animal teratogen. There is currently no available information to suggest that ethylene glycol has caused birth defects in humans. Cutaneous application of ethylene glycol is ineffective in producing developmental toxicity. Exposure to high aerosol concentrations is only minimally effective in producing developmental toxicity.

Specific target organ systemic toxicity - single exposure
No information available.

Specific target organ systemic toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure if swallowed.

Aspiration hazard
No information available.

12. ECOLOGICAL INFORMATION

Ecotoxicity
.

Chemical Name	Ecotoxicity - Freshwater Algae Data	Ecotoxicity - Fish Species Data	Toxicity to microorganisms	Crustacea
Ethylene Glycol 107-21-1	6500 - 13000 mg/L EC50 Pseudokirchneriella subcapitata 96 h	41000 mg/L LC50 (Oncorhynchus mykiss) 96 h 14 - 18 mL/L LC50 (Oncorhynchus mykiss) 96 h static 27540 mg/L LC50 (Lepomis macrochirus) 96 h static 40761 mg/L LC50 (Oncorhynchus mykiss) 96 h static 40000 - 60000 mg/L LC50 (Pimephales promelas) 96 h static 16000 mg/L LC50 (Poecilia reticulata) 96 h static	Not available	EC50: =46300mg/L (48h, Daphnia magna)

Persistence and degradability No information available.

Bioaccumulation No information available.

Component Information

Chemical Name	Partition coefficient
Ethylene Glycol 107-21-1	-1.93

Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.

Do not reuse empty containers.

14. TRANSPORT INFORMATION

TDG (Canada):

UN Number	Not applicable
Shipping name	Not regulated
Class	Not applicable
Packing Group	Not applicable
Marine pollutant	Not available.

DOT (U.S.)

UN Number	Not applicable
Shipping name	Not regulated
Class	Not applicable
Packing Group	Not applicable
Marine pollutant	Not available

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Regulatory Rules

Chemical Name	CERCLA/SARA - Section 302:	SARA (311, 312) Hazard Class:	CERCLA/SARA - Section 313:
Ethylene Glycol - 107-21-1	Not Listed	Listed	Listed

International Inventories

TSCA	Complies
DSL/NDSL	Complies

Legend:
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

NFPA:	**Health hazards** 1	**Flammability** 1	**Instability** 0	**Physical and chemical properties** -
HMIS Health Rating:	**Health hazards** 2	**Flammability** 1	**Physical hazards** 0	**Personal protection** X

Legend Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

TWA	TWA (time-weighted average)	STEL	STEL (Short Term Exposure Limit)
Ceiling	Maximum limit value	*	Skin designation

Prepared By: The Environment, Health and Safety Department of Univar Canada Ltd.

Preparation Date: 26/Jan/2018
Revision Date: 26/Jan/2018

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End of Safety Data Sheet

SAFETY DATA SHEET

Methanol

Section 1. Identification

Product identifier : Methanol

Product code : Q01347

Relevant identified uses of the substance or mixture

Identified uses
Industrial applications

Supplier's details : QUADRA CHEMICALS LTD.
3901 F.X Tessier
Vaudreuil-Dorion, QC
CANADA J7V 5V5
1-800-665-6553

Emergency telephone number (with hours of operation) : **TRANSPORTATION EMERGENCY - 24HRS/DAY - 7 DAYS/WEEK IN CANADA - CALL 1-800-567-7455**

Section 2. Hazard identification

Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 2
ACUTE TOXICITY (oral) - Category 3
ACUTE TOXICITY (dermal) - Category 3
ACUTE TOXICITY (inhalation) - Category 3
EYE IRRITATION - Category 2A
TOXIC TO REPRODUCTION (Unborn child) - Category 1
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (central nervous system (CNS), optic nerve) - Category 1

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Highly flammable liquid and vapor.
Toxic if swallowed, in contact with skin or if inhaled.
Causes serious eye irritation.
May damage the unborn child.
Causes damage to organs. (central nervous system (CNS), optic nerve)

Precautionary statements

Prevention : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves. Wear eye or face protection. Wear protective clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only outdoors or in a well-ventilated area. Do not breathe vapor. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

Section 2. Hazard identification

Response : IF exposed or concerned: Call a POISON CENTER or physician. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF ON SKIN: Take off immediately all contaminated clothing and wash it before reuse. Wash with plenty of soap and water. Call a POISON CENTER or physician if you feel unwell. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.

Storage : Store locked up.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Section 3. Composition/information on ingredients

Substance/mixture : Substance

Ingredient name	% (w/w)	CAS number
methanol	99.85 - 100	67-56-1

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.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First-aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention. If necessary, call a poison center or physician.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact : Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. If necessary, call a poison center or physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a

Section 4. First-aid measures

collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Toxic if inhaled.

Skin contact : Toxic in contact with skin.

Ingestion : Toxic if swallowed.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

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

Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical : Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

Section 5. Fire-fighting measures

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

Special protective actions for fire-fighters : 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.

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.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : 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 spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled 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 and materials for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. 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. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. 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). 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

Section 7. Handling and storage

Protective measures : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. 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 only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : 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. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : 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. Store locked up. 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

Occupational exposure limits

Ingredient name	Exposure limits
methanol	**ACGIH TLV (United States, 3/2017). Absorbed through skin.** TWA: 200 ppm 8 hours. TWA: 262 mg/m³ 8 hours. STEL: 250 ppm 15 minutes. STEL: 328 mg/m³ 15 minutes.

Appropriate engineering controls : 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, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

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.

Individual protection measures

Section 8. Exposure controls/personal protection

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.

Eye/face protection : 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, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Hand protection : 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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : 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. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Physical state : Liquid. [Clear.]

Color : Colourless.

Odor : Alcohol-like.

Odor threshold : Not available.

pH : Not available.

Melting point : -97.8°C (-144°F)

Boiling point : 64.7°C (148.5°F)

Flash point : Closed cup: 11°C (51.8°F)

Evaporation rate : 4.1 (n-butyl acetate = 1)

Flammability (solid, gas) : Not available.

Lower and upper explosive (flammable) limits : Lower: 5.5%
Upper: 36.5%

Vapor pressure : 12.8 kPa (96 mm Hg) [room temperature]

Vapor density : 1.1 [Air = 1]

Relative density : 0.791 to 0.793 [@ 20°C]

Density : 0.792 g/cm³

Solubility : Soluble in the following materials: cold water.

Dispersibility properties : Not available.

Section 9. Physical and chemical properties

Partition coefficient: n-octanol/water : Not available.

Auto-ignition temperature : 464°C (867.2°F)

Decomposition temperature : Not available.

Viscosity : Dynamic (room temperature): 0.8 mPa·s (0.8 cP)

Volatility : 100% (v/v)

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.

Incompatible materials : oxidizing materials
metals
acids
alkalis

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
methanol	LC50 Inhalation Vapor LD50 Dermal LD50 Oral	Rat Rabbit Rat	189950 mg/m³ 15800 mg/kg 5600 mg/kg	1 hours - -

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
methanol	Eyes - Moderate irritant Eyes - Moderate irritant Skin - Moderate irritant	Rabbit Rabbit Rabbit	- - -	24 hours 100 milligrams 40 milligrams 24 hours 20 milligrams	- - -

Sensitization

Not available.

Mutagenicity

Not available.

Section 11. Toxicological information

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
methanol	Category 1	Not determined	central nervous system (CNS) and optic nerve

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact : Causes serious eye irritation.

Inhalation : Toxic if inhaled.

Skin contact : Toxic in contact with skin.

Ingestion : Toxic if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Skin contact : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Ingestion : Adverse symptoms may include the following:
reduced fetal weight
increase in fetal deaths
skeletal malformations

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Section 11. Toxicological information

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General : No known significant effects or critical hazards.

Teratogenicity : May damage the unborn child.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
Oral	100 mg/kg
Dermal	300 mg/kg
Inhalation (vapors)	3 mg/l

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
methanol	Acute EC50 16.912 mg/l Marine water	Algae - Ulva pertusa	96 hours
	Acute LC50 2500000 µg/l Marine water	Crustaceans - Crangon crangon - Adult	48 hours
	Acute LC50 3289 mg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 290 mg/l Fresh water	Fish - Danio rerio - Egg	96 hours
	Chronic NOEC 9.96 mg/l Marine water	Algae - Ulva pertusa	96 hours
Methanol	EC50 >10000 mg/l	Daphnia	48 days
	IC50 22000 mg/l	Algae - Pseudokirchneriella subcapitata	72 hours
	LC50 15400 to 29400 mg/l	Fish	96 hours

Persistence and degradability

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Methanol	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
methanol	-0.77	<10	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. 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. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. 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 spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	TDG Classification
UN number	1230
UN proper shipping name	METHANOL
Transport hazard class(es)	3 (6.1)
Packing group	II
Additional information	Not available.

Section 15. Regulatory information

Canada inventory : All components are listed or exempted.

Section 16. Other information

History

Date of issue/Date of revision : 8 February 2018

Prepared by : Regulatory Affairs

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
LogPow = logarithm of the octanol/water partition coefficient
UN = United Nations
HPR = Hazardous Products Regulations

Procedure used to derive the classification

Section 16. Other information

Classification	Justification
FLAMMABLE LIQUIDS - Category 2	On basis of test data
ACUTE TOXICITY (oral) - Category 3	Calculation method
ACUTE TOXICITY (dermal) - Category 3	Calculation method
ACUTE TOXICITY (inhalation) - Category 3	Calculation method
EYE IRRITATION - Category 2A	Calculation method
TOXIC TO REPRODUCTION (Unborn child) - Category 1	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (central nervous system (CNS), optic nerve) - Category 1	Calculation method

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.

Potassium Chloride

SECTION 1. IDENTIFICATION

Product Identifier	Potassium Chloride
Other Means of Identification	None
Other Identification	KCl
Product Family	Salt
Recommended Use	Drilling Fluid Additive.
Restrictions on Use	None known.
Supplier Identifier	Secure Energy Services Suite 3600, 205 - 5 Avenue SW, Calgary, Alberta, T2P 2V7, www.secure-energy.com
Emergency Phone No.	CANUTEC, (613) 996-6666, 24/7
Date of Preparation	April 12, 2017

SECTION 2. HAZARD IDENTIFICATION

Classification

Not classified under any hazard class.

Label Elements

Not applicable

Other Hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	%	Other Identifiers	Other Names
Potassium chloride	7447-40-7	100	None	KCl

Notes

Concentrations are expressed in % weight/weight.

SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

If symptoms are experienced, remove source of contamination or move victim to fresh air. Obtain medical advice.

Skin Contact

No health effects expected. Flush with lukewarm, gently flowing water for 5 minutes. If irritation persists, repeat flushing. Obtain medical advice.

Eye Contact

If irritation occurs, flush the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes. If irritation persists, obtain medical advice.

Ingestion

If irritation or discomfort occur, obtain medical advice.

First-aid Comments

Get medical advice or attention if you feel unwell or are concerned.

Most Important Symptoms and Effects, Acute and Delayed

Mild irritation to skin, eyes, respiratory tract (dust).

Immediate Medical Attention and Special Treatment

Target Organs

Eyes, skin.

Special Instructions

Not applicable.

Medical Conditions Aggravated by Exposure

Eye conditions, skin conditions.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Does not burn or support combustion. Use extinguishing media suitable for surrounding fire.

Unsuitable Extinguishing Media

Not applicable.

Specific Hazards Arising from the Product

Closed containers may rupture violently when heated releasing contents.
During a fire, corrosive and toxic hydrogen chloride and/or chlorine gases, dipotassium oxide and other toxic and irritating fumes and gases may be formed by thermal decomposition.

Special Protective Equipment and Precautions for Fire-fighters

Evacuate area and fight fire from a safe distance or a protected location. Approach fire from upwind to avoid hazardous vapours and toxic decomposition products.
Closed containers may rupture violently when exposed to the heat of the fire. If possible, isolate materials not yet involved in the fire, and move containers from the fire area if this can be done without risk, and protect personnel. Otherwise, apply water in flooding quantities to keep fire-exposed containers, tanks or car/trailer loads cool and absorb heat to help prevent rupture. Water spray may also be used to knock down corrosive fumes which may be produced in a fire. Apply water from the side and from a safe distance until well after the fire is out. Dike fire control water for appropriate disposal.
Tanks or drums should not be approached directly after they have been involved in a fire, until they have been completely cooled down.
Potassium has very low toxicity although hazardous decomposition products are possible in a fire. Firefighters may enter the area if positive pressure self-contained breathing apparatus (NIOSH approved or equivalent) and full Bunker Gear is worn.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

Ensure clean-up is conducted by trained personnel. Wear adequate personal protective equipment. Ventilate area. Use the personal protective equipment recommended in Section 8 of this safety data sheet.

Environmental Precautions

It is good practice to prevent releases into the environment.

Methods and Materials for Containment and Cleaning Up

Use vacuum equipped with HEPA filter(s). Alternatively, dampen spilled material with water. Shovel into clean, dry, labelled containers. Cover containers. Flush area with water.

Other Information

Report spills to local health, safety and environmental authorities, as required.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

This material is essentially non-hazardous. Avoid generating dusts. Avoid the release of dusts into the workplace air. Keep containers closed when not in used. Good housekeeping is important to prevent accumulations of dust. Do not use with incompatible materials.

Conditions for Safe Storage

Store in suitable, labelled containers. Protect from damage. It is good practice to keep storage containers closed when not in use. Store away from incompatible materials. Comply with all applicable health and safety regulations, fire and building codes.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

	ACGIH TLV®		OSHA PEL		AIHA WEEL	
Chemical Name	**TWA**	**STEL**	**TWA**	**Ceiling**	**8-hr TWA**	**TWA**
Potassium chloride	Not established	Not established	Not established	Not established	Not established	Not established

Appropriate Engineering Controls

The hazard potential of this material is relatively low. General (dilution) ventilation is usually sufficient. When there is large-scale use of this material (eg. bagging operation), engineering methods to control hazardous conditions may be necessary. Use local exhaust ventilation and process enclosure to control airborne dust. A dust collecting system attached to the ventilation system may also be necessary.
Supply sufficient replacement air to make up for air removed by exhaust systems. Provide eyewash and safety shower if contact or splash hazard exists.

Individual Protection Measures

Eye/Face Protection

No specific requirement, but it is good practice to wear chemical safety goggles.

Skin Protection

No specific requirement, but it is good practice to prevent skin contact.

Respiratory Protection

Respiratory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties

Appearance	Colourless - white crystalline powder. Particle Size: Not available
Odour	Odourless
Odour Threshold	Not applicable
pH	~ 7 (saturated solution)
Melting Point/Freezing Point	771 ºC (1420 ºF) (melting); 771 ºC (1420 ºF) (freezing)
Initial Boiling Point/Range	1407 ºC (2565 ºF)
Flash Point	Not applicable
Evaporation Rate	Not applicable
Flammability (solid, gas)	Will not burn.

Upper/Lower Flammability or Explosive Limit	Not applicable (upper); Not applicable (lower)
Vapour Pressure	Very low.
Vapour Density (air = 1)	Not applicable
Relative Density (water = 1)	1.98 - 1.99
Solubility	34.2 g/100 mL (Very soluble) in water; Mildly soluble in alcohols (e.g. ethanol).
Partition Coefficient, n-Octanol/Water (Log Kow)	Not applicable
Auto-ignition Temperature	Not applicable
Decomposition Temperature	Not available
Viscosity	Not applicable (kinematic); Not applicable (dynamic)

Other Information

Physical State	Solid
Molecular Formula	K-Cl
Molecular Weight	74.55
Bulk Density	Not available
Surface Tension	Not applicable
Critical Temperature	Not applicable
Electrical Conductivity	Not available
Vapour Pressure at 50 deg C	Not available
Saturated Vapour Concentration	Not available

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Not reactive under normal conditions of use.

Chemical Stability

Normally stable.

Possibility of Hazardous Reactions

None expected under normal conditions of storage and use.

Conditions to Avoid

Generation of dust. Incompatible materials.

Incompatible Materials

PEROXYACETIC ACID and ACETIC ACID - addition of potassium chloride to aqueous solutions containing 40% peroxyacetic acid and 1% acetic acid lead to a violently exothermic decomposition reaction, with the evolution of chlorine gas.
POTASSIUM PERMANGANATE and SULFURIC ACID - mixture may explode.
BROMINE TRIFLUORIDE - rapidly attacks potassium chloride.

Hazardous Decomposition Products

Corrosive and toxic hydrogen chloride and/or chlorine gases and dipotassium oxide may be formed by thermal decomposition or in a fire.

SECTION 11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Skin contact; eye contact; inhalation.

Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Potassium chloride	Not available	2430 mg/kg (rat)	Not available

Skin Corrosion/Irritation

Potassium chloride is probably a non-irritant to mild irritant. This conclusion is based on limited human information for potassium chloride and comparison to sodium chloride.

Serious Eye Damage/Irritation

Potassium chloride is probably a non-irritant to very mild irritant based on comparison to sodium chloride. Unconfirmed animal information for potassium chloride shows mild irritation. No human information was located.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

Potassium chloride does not form a vapour. Exposure to dust or mists from solutions may be slightly irritating to the nose and throat, but is not expected to cause significant harmful effects. No human or animal information was located.

Skin Absorption

Potassium chloride is not expected to be absorbed through the skin.

Ingestion

Potassium chloride is not toxic if ingested based on animal toxicity values. Harmful effects in humans are rare because a large single dose results in nausea and vomiting and because potassium chloride is readily excreted in the urine. An estimated oral lethal dose in humans is 500-5000 mg/kg. Ingestion is not a typical route of occupational exposure.

Aspiration Hazard

Not known to be an aspiration hazard.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

Potassium chloride generally has very low toxicity and is not expected to cause long-term health effects following occupational exposure.

Respiratory and/or Skin Sensitization

Not a skin sensitizer. Not a respiratory sensitizer.

Carcinogenicity

Chemical Name	IARC	ACGIH®	NTP	OSHA
Potassium chloride	Not Listed	Not designated	Not Listed	Not Listed

Reproductive Toxicity

Development of Offspring

Potassium chloride is not known to cause developmental toxicity. No human information was located.

Sexual Function and Fertility

Potassium chloride is not known to cause reproductive toxicity. No human or animal information was located.

Effects on or via Lactation

No information was located.
No information was located.

Germ Cell Mutagenicity

Potassium chloride is not known to be mutagenic. No studies in humans or live animals were located. The positive results obtained in short-term tests are believed to result from an osmotic effect rather than from mutagenicity.

Interactive Effects

No information was located.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

No information was located.

Acute Aquatic Toxicity

Chemical Name	LC50 Fish	EC50 Crustacea	ErC50 Aquatic Plants	ErC50 Algae
Potassium chloride	880 mg/L (Pimephales promelas (fathead minnow); 96-hour; fresh water; static)	29 mg/L (Daphnia magna (water flea); 96-hour; fresh water; static)	Not available	Not available

Persistence and Degradability

No information was located.

Bioaccumulative Potential

No information was located.

Mobility in Soil

No information was located.

Other Adverse Effects

There is no information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

Contact local environmental authorities for approved disposal or recycling methods in your jurisdiction. The required hazard evaluation of the waste and compliance with the applicable hazardous waste laws are the responsibility of the user. Store product for disposal as described under Storage in Section 7 of this safety data sheet. Dispose of or recycle empty containers through an approved waste management facility.

SECTION 14. TRANSPORT INFORMATION

Not regulated under Canadian TDG regulations. Not regulated under US DOT Regulations.

Environmental Hazards Not applicable

Special Precautions Not applicable

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

SARA Title III - Section 302: Not listed. SARA Title III - Section 311/312: Not listed. SARA Title III - Section 313: Not listed. Massachusetts Right To Know: Not listed. Pennsylvania Right To Know: Listed. New Jersey Right To Know: Listed. California Proposition 65: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

SECTION 16. OTHER INFORMATION

SDS Prepared By	Safety Committee
Phone No.	403-264-1588
Date of Preparation	April 12, 2017
Date of Last Revision	April 12, 2017
Revision Indicators	Not applicable.
Key to Abbreviations	ACGIH® = American Conference of Governmental Industrial Hygienists AIHA® = AIHA® Guideline Foundation DSL = Domestic Substances List HSDB® = Hazardous Substances Data Bank IARC = International Agency for Research on Cancer IDLH = Immediately Dangerous to Life and Health NDSL = Non-Domestic Substances List NFPA = National Fire Protection Association NIOSH = National Institute for Occupational Safety and Health NTP = National Toxicology Program OSHA = US Occupational Safety and Health Administration PEL = Permissible Exposure Limit REL = Recommended Exposure Limit RTECS® = Registry of Toxic Effects of Chemical Substances STEL = Short Term Exposure Limit TSCA = Toxic Substances Control Act TWA = Time Weighted Average
References	CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). HSDB® database. US National Library of Medicine. Available from Canadian Centre for Occupational Health and Safety (CCOHS). Registry of Toxic Effects of Chemical Substances (RTECS®) database. Dassault Systèmes/BIOVIA ("BIOVIA"). Available from Canadian Centre for Occupational Health and Safety (CCOHS).
Disclaimer	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. Secure Energy Services expressly disclaims all expressed or implied warranties of merchantability and fitness for a particular purpose with respect to the product provided.

SAFETY DATA SHEET
According to the Hazardous Products Regulations

Quaker State Automatic Transmission Fluid

Version	Revision Date:	SDS Number:	Print Date: 2016-04-28
1.4	2016-04-06	800001003748	Date of last issue: 08.03.2013
			Date of first issue: 08.03.2013

SECTION 1. IDENTIFICATION

Product name : Quaker State Automatic Transmission Fluid

Product code : 001B0927

Manufacturer or supplier's details

Manufacturer/Supplier : **Shell Canada Products**
400 - 4th Avenue S.W
Calgary AB T2P 0J4
Canada

Telephone : (+1) 8006611600
Telefax : (+1) 4033848345

Emergency telephone number : CHEMTREC (24 hr): 1 (703) 527-3887 or 1 (800) 424-9300 (US)
CANUTEC (24 hr): (+1) 613-996-6666; Toll Free: 1-888-CAN-UTEC (226-8832)

Recommended use of the chemical and restrictions on use

Recommended use : Transmission oil.

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Not a hazardous substance or mixture.

GHS label elements

Hazard pictograms : No Hazard Symbol required

Signal word : No signal word

Hazard statements : PHYSICAL HAZARDS:
Not classified as a physical hazard under GHS criteria.
HEALTH HAZARDS:
Not classified as a health hazard under GHS criteria.
ENVIRONMENTAL HAZARDS:
Not classified as an environmental hazard under GHS criteria.

Precautionary statements : **Prevention:**
No precautionary phrases.
Response:
No precautionary phrases.

Storage:
No precautionary phrases.
Disposal:
No precautionary phrases.

Other hazards which do not result in classification
Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.
Used oil may contain harmful impurities.
Not classified as flammable but will burn.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name : Quaker State Automatic Transmission Fluid

Chemical nature : Highly refined mineral oils and additives.
The highly refined mineral oil contains <3% (w/w) DMSO-extract, according to IP346.

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Alkyl methacrylates copolymer	Not Assigned	1 - 3
Interchangeable low viscosity base oil (<20,5 cSt @40°C) *	Not Assigned	0 - 90

SECTION 4. FIRST-AID MEASURES

General advice : Not expected to be a health hazard when used under normal conditions.

If inhaled : No treatment necessary under normal conditions of use.
If symptoms persist, obtain medical advice.

In case of skin contact : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.
If persistent irritation occurs, obtain medical attention.

In case of eye contact : Flush eye with copious quantities of water.
If persistent irritation occurs, obtain medical attention.

If swallowed : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

Most important symptoms and effects, both acute and delayed : Oil acne/folliculitis signs and symptoms may include formation of black pustules and spots on the skin of exposed areas.
Ingestion may result in nausea, vomiting and/or diarrhoea.

Protection of first-aiders : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the

incident, injury and surroundings.

Notes to physician : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

Unsuitable extinguishing media : Do not use water in a jet.

Specific hazards during fire-fighting : Hazardous combustion products may include:
A complex mixture of airborne solid and liquid particulates and gases (smoke).
Carbon monoxide may be evolved if incomplete combustion occurs.
Unidentified organic and inorganic compounds.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special protective equipment for firefighters : Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Avoid contact with skin and eyes.

Environmental precautions : Use appropriate containment to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.

Local authorities should be advised if significant spillages cannot be contained.

Methods and materials for containment and cleaning up : Slippery when spilt. Avoid accidents, clean up immediately.
Prevent from spreading by making a barrier with sand, earth or other containment material.
Reclaim liquid directly or in an absorbent.
Soak up residue with an absorbent such as clay, sand or other suitable material and dispose of properly.

Additional advice	:	For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.

SECTION 7. HANDLING AND STORAGE

General Precautions	:	Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.
Advice on safe handling	:	Avoid prolonged or repeated contact with skin. Avoid inhaling vapour and/or mists. When handling product in drums, safety footwear should be worn and proper handling equipment should be used. Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
Avoidance of contact	:	Strong oxidising agents.
Product Transfer	:	This material has the potential to be a static accumulator. Proper grounding and bonding procedures should be used during all bulk transfer operations.

Storage

Other data	:	Keep container tightly closed and in a cool, well-ventilated place. Use properly labeled and closable containers. Store at ambient temperature.
Packaging material	:	Suitable material: For containers or container linings, use mild steel or high density polyethylene. Unsuitable material: PVC.
Container Advice	:	Polyethylene containers should not be exposed to high temperatures because of possible risk of distortion.

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

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

		exposure)	concentration	
Oil mist, mineral	Not Assigned	TWA ((inhalable fraction))	5 mg/m3	US. ACGIH Threshold Limit Values

Biological occupational exposure limits

No biological limit allocated.

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.
Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.
Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.
National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods http://www.cdc.gov/niosh/
Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods http://www.osha.gov/
Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances http://www.hse.gov.uk/
Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany http://www.dguv.de/inhalt/index.jsp
L'Institut National de Recherche et de Securité, (INRS), France http://www.inrs.fr/accueil

Engineering measures : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:
Adequate ventilation to control airborne concentrations.

Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated.

General Information:
Define procedures for safe handling and maintenance of controls.
Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.
Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.
Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and

protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

Personal protective equipment

Respiratory protection : No respiratory protection is ordinarily required under normal conditions of use.
In accordance with good industrial hygiene practices, precautions should be taken to avoid breathing of material.
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation.
Check with respiratory protective equipment suppliers.
Where air-filtering respirators are suitable, select an appropriate combination of mask and filter.
Select a filter suitable for the combination of organic gases and vapours [Type A/Type P boiling point >65°C (149°F)].

Hand protection
Remarks : Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. PVC, neoprene or nitrile rubber gloves Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model.

Eye protection : If material is handled such that it could be splashed into eyes, protective eyewear is recommended.

Skin and body protection : Skin protection is not ordinarily required beyond standard work clothes.
It is good practice to wear chemical resistant gloves.

Thermal hazards	:	Not applicable
Protective measures	:	Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

Environmental exposure controls

General advice	:	Take appropriate measures to fulfill the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water. Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Liquid at room temperature.
Colour	:	red
Odour	:	Slight hydrocarbon
Odour Threshold	:	Data not available
pH	:	Not applicable
pour point	:	-48 °C / -54 °F Method: ISO 3016
Initial boiling point and boiling range	:	> 280 °C / 536 °F estimated value(s)
Flash point	:	180 °C / 356 °F Method: ISO 2592
Evaporation rate	:	Data not available
Flammability (solid, gas)	:	Data not available
Upper explosion limit	:	Typical 10 %(V)
Lower explosion limit	:	Typical 1 %(V)

Vapour pressure	:	< 0.5 Pa (20 °C / 68 °F) estimated value(s)
Relative vapour density	:	> 1 estimated value(s)
Relative density	:	0.864 (15 °C / 59 °F)
Density	:	864 kg/m3 (15.0 °C / 59.0 °F)Method: ISO 12185
Solubility(ies)		
Water solubility	:	negligible
Solubility in other solvents	:	Data not available
Partition coefficient: n-octanol/water	:	Pow: > 6 (based on information on similar products)
Auto-ignition temperature	:	> 320 °C / 608 °F
Viscosity		
Viscosity, dynamic	:	Data not available
Viscosity, kinematic	:	7.3 mm2/s (100 °C / 212 °F) Method: ISO 3104 33.8 mm2/s (40.0 °C / 104.0 °F) Method: ISO 3104
Explosive properties	:	Not classified
Oxidizing properties	:	Data not available
Conductivity	:	This material is not expected to be a static accumulator.
Decomposition temperature	:	Data not available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	The product does not pose any further reactivity hazards in addition to those listed in the following sub-paragraph.
Chemical stability	:	Stable.
Possibility of hazardous reactions	:	Reacts with strong oxidising agents.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Strong oxidising agents.

Hazardous decomposition products	:	Hazardous decomposition products are not expected to form during normal storage.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on data on the components and the toxicology of similar products.Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

Information on likely routes of exposure
Skin and eye contact are the primary routes of exposure although exposure may occur following accidental ingestion.

Acute toxicity

Product:

Acute oral toxicity	:	LD50 (rat): > 5,000 mg/kg Remarks: Expected to be of low toxicity:
Acute inhalation toxicity	:	Remarks: Not considered to be an inhalation hazard under normal conditions of use.
Acute dermal toxicity	:	LD50 (Rabbit): > 5,000 mg/kg Remarks: Expected to be of low toxicity:

Skin corrosion/irritation

Product:
Remarks: Expected to be slightly irritating.
Prolonged or repeated skin contact without proper cleaning can clog the pores of the skin resulting in disorders such as oil acne/folliculitis.

Serious eye damage/eye irritation

Product:
Remarks: Expected to be slightly irritating.

Respiratory or skin sensitisation

Product:
Remarks: Not expected to be a skin sensitiser.

Germ cell mutagenicity

Product:

Genotoxicity in vivo	:	Remarks: Not considered a mutagenic hazard.

Carcinogenicity

Product:

Remarks: Not expected to be carcinogenic.

Remarks: Product contains mineral oils of types shown to be non-carcinogenic in animal skin-painting studies.
Highly refined mineral oils are not classified as carcinogenic by the International Agency for Research on Cancer (IARC).

Reproductive toxicity

Product:

Effects on fertility : Remarks: Not expected to impair fertility.
Not expected to be a developmental toxicant.

STOT - single exposure

Product:

Remarks: Not expected to be a hazard.

STOT - repeated exposure

Product:

Remarks: Not expected to be a hazard.

Aspiration toxicity

Product:

Not considered an aspiration hazard.

Further information

Product:

Remarks: Used oils may contain harmful impurities that have accumulated during use. The concentration of such impurities will depend on use and they may present risks to health and the environment on disposal.
ALL used oil should be handled with caution and skin contact avoided as far as possible.

Remarks: Slightly irritating to respiratory system.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : Ecotoxicological data have not been determined specifically for this product.
Information given is based on a knowledge of the components and the ecotoxicology of similar products.

Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).(LL/EL/IL50 expressed as the nominal amount of product required to prepare aqueous test extract).

Ecotoxicity

Product:

Toxicity to fish (Acute toxicity)	:	Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to crustacean (Acute toxicity)	:	Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to algae/aquatic plants (Acute toxicity)	:	Remarks: Expected to be practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to fish (Chronic toxicity)	:	Remarks: Data not available
Toxicity to crustacean (Chronic toxicity)	:	Remarks: Data not available
Toxicity to microorganisms (Acute toxicity)	:	Remarks: Data not available

Persistence and degradability

Product:

Biodegradability	:	Remarks: Expected to be not readily biodegradable. Major constituents are expected to be inherently biodegradable, but contains components that may persist in the environment.

Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: Contains components with the potential to bioaccumulate.
Partition coefficient: n-octanol/water	:	Pow: > 6 Remarks: (based on information on similar products)

Mobility in soil

Product:

Mobility	:	Remarks: Liquid under most environmental conditions. If it enters soil, it will adsorb to soil particles and will not be mobile.

Remarks: Floats on water.

Other adverse effects

Product:

Additional ecological information : Product is a mixture of non-volatile components, which are not expected to be released to air in any significant quantities. Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

Poorly soluble mixture.
May cause physical fouling of aquatic organisms.

Mineral oil is not expected to cause any chronic effects to aquatic organisms at concentrations less than 1 mg/l.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Waste product should not be allowed to contaminate soil or ground water, or be disposed of into the environment. Waste, spills or used product is dangerous waste.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.

Contaminated packaging : Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of the collector or contractor should be established beforehand. Disposal should be in accordance with applicable regional, national, and local laws and regulations.

SECTION 14. TRANSPORT INFORMATION

National Regulations

TDG
Not regulated as a dangerous good

International Regulation

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

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

Pollution category	:	Not applicable
Ship type	:	Not applicable
Product name	:	Not applicable
Special precautions	:	Not applicable

Special precautions for user

Remarks	:	Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.
Additional Information	**:**	MARPOL Annex 1 rules apply for bulk shipments by sea.

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all the information required by the HPR.

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

EINECS	:	All components listed or polymer exempt.
TSCA	:	All components listed.
DSL	:	All components listed.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; CPR - Controlled Products Regulations; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC -

No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

A vertical bar (|) in the left margin indicates an amendment from the previous version.
Revision Date : 2016-04-06

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.

CA / EN

Appendix C: Emergency Spill Response Procedures and Organizational Flow Chart

Northwest Territories Petroleum Industry Release Reporting Requirements

All spills exceeding the spill/release quotas listed in the table on the following page MUST be reported immediately to the appropriate regulatory agency.

Agency	Reportable Spills	Report Type	Report To
Office of the Regulator of Oil and Gas Operations (OROGO)	Operators must report **all incidents and near-misses** to the Regulator as soon as the circumstances permit by calling 1-867-445-8551.	Verbal	(OROGO) 1-867-445-8551
		Written	Operators must submit an investigation report, within 21 days of the day an incident or near-miss occurs, if the incident or near-miss involves: ~ A death ~ An injury that required time off work ~ A fire or explosion ~ A leak ~ An immediate threat to safety or ~ A significant pollution event
The Department of Environment and Natural Resources (ENR)	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 Substances regulated by Environment and Natural Resources if: 1) Release meets or exceeds the reporting threshold in the NWT spill Reporting Requirements column in the **Reportable Threshold table** on the following page.	Verbal	NWT/Nunavut 24 Hr. Spill Reporting Line 867-920-8130
		Written	Fill out the Spill Report Form found at: https://www.enr.gov.nt.ca/sites/enr/files/128-spill_report_form_e_fillable_1.pdf Submit the completed form via: Fax: 867-873-6924 OR Email: spills@gov.nt.ca
Transportation of Dangerous Goods (TDG)	Substances regulated by Transportation of Dangerous Goods if: 1) A release is anticipated, or the release meets or exceeds the reporting threshold in the TDG Reporting Requirements column in the **Release Reporting Thresholds** table on the following page.	Verbal	911 Local Authority 403-873-7406 (Yellowknife)
		Written	Within 30 days
Canadian Transport Emergency Centre (CANUTEC)	Loss and theft reporting: 1) CANUTEC - all loss or theft of dangerous goods materials 2) Natural Resources Canada Inspector - Class 1 explosive materials only 3) Canadian Nuclear Safety Commission - Class 7 radioactive materials only	Verbal	1) 888-226-8832 or 613-996-6666 2) 613-995-5555 3) 613-995-0479
		Written	Within 30 days
Department of Fisheries and Oceans (DFO)	A release of any substance deleterious to fish into a fish bearing water body.	Verbal	Inuvik 867-777-7500 Yellowknife 867-669-4900
National Energy Board (NEB)	Immediately reportable events as defined in the NEB Event Reporting Guidelines December 2017: 1) An incident that harms people or the environment, 2) A rupture, or 3) A toxic plume Note: Immediately reportable incidents must be reported within 3 hours to both the TSB Reporting Hotline and NEB's OERS. If applicable, refer to the Federal Roles & Responsibilities chart in SECTION 5: EXTERNAL AGENCIES and the NEB site section behind the AREA SPECIFIC INFORMATION tab for further regulations, definitions and reporting guidelines.	Verbal	Via Transportation Safety Board (TSB) Reporting Hotline 819-997-7887
		Written	NEB Online Event Reporting System (OERS) https://apps.neb-one.gc.ca/ers/home/index
Indian Oil & Gas (IOGC)	Immediately reportable events on First Nation reserve lands only: 1) Any health or environment-threatening emergency or off-lease spills. 2) On-lease spills greater than $1m^3$.	Verbal	IOGC Tsuu T'ina Office 403-292-5625

Note: The Departments of Environment and Natural Resources and Lands, and the Office of the Regulator of Oil and Gas Operations (OROGO) are responsible for coordinating Government of the Northwest Territories regulatory oversight and investigation of hazardous material spills in NWT under their respective jurisdictions.

Note: Spills must be reported promptly to avoid possible prosecution.

Lead Agency Contact Numbers	
Northwest Territories	
The Office of the Oil and Gas Regulator (OROGO)	1-867-445-8551
NWT/Nunavut 24 Hr. Spill Reporting Line	1-867-920-8130
Canada	
CANUTEC	
All Provinces	888-CAN-UTEC (888-226-8832) 613-996-6666
National Energy Board / Transportation Safety Board of Canada	
Incident Reporting Line	819-997-7887

See following page for spill / release quotas.

Northwest Territories Petroleum Industry Release Reporting Requirements

All spills exceeding the spill/release quotas listed in the table on the following page MUST be reported immediately to the appropriate regulatory agency.

Chemical Class	Substance / Example	T.D.G. Reporting Requirements		OROGO / ENR Reporting Requirements
		Road, Rail or Marine	Loss or Theft	
Spilled Liquid Substances	Hydraulic Oil	No TDG Reporting Requirements		When released on a frozen water body that is being used as a working surface
	Methanol	See Class 3 & 6.1		
	Natural Gas	See Class 2.1		Uncontrolled release or sustained flow of 10 minutes or more
	Crude Oil / Emulsion (Unrefined)	See Class 3		>100 L or 100 kg
	Produced / Salt Water (Unrefined)	No TDG Reporting Requirements		
	Drilling Fluid or Invert Mud			
	Condensate (Unrefined)	See Class 3		
	Glycol	No TDG Reporting Requirements		No Reporting Requirement
	Fresh Water			
	Any fluid with toxic substances			>5L or 5 kg
Class 1 Explosives	Ammunition Nitro-glycerine	Any quantity of Packing Group II	Any quantity in Class 1.1, 1.2, and 1,3 Total quantity of 450 kg or more in Class 1.4 (except 1.4S), 1.5, or 1.6	Any amount
Class 2.1 Flammable Gases	H_2S Methane Propane Butane Natural Gas	Any quantity	Total quantity of 450 kg or more	Any amount of gas from containers with a capacity greater than 100L
Class 2.2 Non-Flammable Gases	Compressed Air O_2 N_2 CO_2		No TDG Reporting Requirements	Any amount of gas from containers with a capacity greater than 100L
Class 2.3 Toxic Gases (poisonous or corrosive)	H_2S SO_2 Hydrogen Cyanide Nitric Acid Anhydrous Ammonia		Any quantity	Any amount
Class 3 Flammable Liquids	Gasoline Diesel Methanol Demulsifiers Scale Inhibitors Lube Oil	Any quantity of Packing Group I or II More than 30 L or 30 kg of Packing Group III	Total quantity of 450 kg or more of desensitized explosives Any quantity of UN1261, Nitromethane	>100L
Class 4.1 Flammable Solids	Calcium Resinate Naphthalene Crude		Total quantity of 450 kg or more of desensitized explosives Any quantity of UN1357, Urea Nitrate, with not less than 20% water, by mass; UN3370, Urea Nitrate, Wetted, with not less than 10% water by mass	>25 kg
Class 4.2 Spontaneously Combustible	Activated Carbon Potassium Sulphide Phosphorus		Total quantity of 450 kg or more in Packing Groups I or II	
Class 4.3 Water reactant substances	Molten Sulphur Calcium Carbide Sodium Activated Carbon		Total quantity of 450 kg or more in Packing Groups I or II	
Class 5.1 Oxidizing Substances	Calcium Nitrate Ammonium Nitrate Bleaches		Total quantity of 450 kg or more in Packing Groups I or II Any quantity of UN1485, Potassium Chlorate; UN1486, Potassium Nitrate; UN 1487, Potassium Nitrate and Sodium Nitrate Mixture; UN1489, Potassium Perchlorate; UN1495, Sodium Chlorate; UN1498, Sodium Nitrate; UN1499 Sodium Nitrate and Potassium Nitrate Mixture; UN1511, Urea Hydrogen Peroxide; UN1942 Ammonia Nitrate, with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substances; UN2014 Hydrogen Peroxide, Aqueous Solution with not less than 20% but not less than 60% hydrogen peroxide (stabilized as necessary); UN2015, Hydrogen Peroxide, Stabilized; UN2031, Nitric Acid, other than red fuming; UN3149, Hydrogen Peroxide and Peroxyacetic Acid Mixture with acid (s), water and not more than 5% peroxyacetic acid, stabilized	50 kg or 50 L
Class 5.2 Organic Peroxides	Methyl Ethyl Ketone Peroxide Succinic Acid Peroxide		Any quantity in Class 5.2, Type B, liquid or solid, temperature controlled	>1L or 1 kg
Class 6.1 Poisonous Toxic Substances	Arsenic Lead Acetate Mercuric Oxide Methanol Toxic Pesticides		Any quantity of Packing Group I	>5L or 5 kg
Class 6.2 Infectious Substances	Infectious Substances affecting Humans / Animals Sewage and wastewater	Any quantity of Category A or B	Any quantity	Any amount
Class 7 Radioactive Substances	Uranium Plutonium Naturally Occurring Radioactive Materials (N.O.R.M.)	For packages being transported under exclusive use: (i) 10 mSv/h on the external surface (ii) 2 mSv/h on the surface of the conveyance, and (iii) 0.1 mSv/h at a distance of 2 m from the surface For packages not being transported under exclusive use: (i) 2 mSv/h on the external surface (ii) 0.1 mSv/h at a distance of 1m from the package, (iii) 2 mSv/h on the surface of the conveyance, and (iv) 0.1 mSv/h at a distance of 2m from the surface of the conveyance.	Any quantity	Any amount
Class 8 Corrosives	Acids Bases Batteries Caustic Amine	Any quantity of Packing Group I or II 30 L or 30 kg of Packing Group III	Total quantity of 450 kg or more in Packing Group I or II Any quantity of UN1796, Nitrating Acid Mixture with more than 50% nitric acid; UN1826, Nitrating Acid Mixture, Spent, with more than 50% nitric acid; UN2032, Nitric Acid, Red Fuming	5 kg or 5 L
Class 9 Miscellaneous Products, Substances & Organisms, Environmentally Hazardous Substances	P.C.B. Asbestos Polystyrene Beads Gas Plant Filters Benzoic Acid Chromic Acetate Cupric Sulphate	30 L or 30 kg of Packing Group II or III, or without Packing Group	No TDG Reporting Requirements	>5L or 0.5 kg
Class 9.1 Miscellaneous (except and with PCB mixtures 5 or more ppm)				0.5 L or 100 kg
Class 9.2 Aquatic Toxic				No Reporting Requirement
Class 9.3 Wastes (chronic toxic)				Any amount

Other items in the ENR Spill Reporting Regulation that are applicable but do not fit in the above table format.

Item	Substance Spilled	Specified Amount
	Waste or spent chemicals, used or waste oil, vehicle fluids, wastewater	>100L or 100 kg

For all other reportable substances/quantities, please refer to company SDS sheets for more information.

List of Environment & Climate Change Canada's E2 Regulated Substances: https://ec.gc.ca/ee-ue/default.asp?lang=En&n=06FCD512-1

Spill Response, continued

Spill Response Guidelines

This section provides basic hydrocarbon spill response guidelines. For greater detail, refer to the Western Canada Spill Services (WCSS) manuals, applicable Safety Data Sheets (SDS) and the Emergency Response Assistance Canada (ERAC) Plan. Refer to the Petroleum Industry Release Reporting Requirements chart at the beginning of this section to determine the TDG and Provincial Reporting Requirements for each class of chemicals (as classified by the TDG Hazard Classification System).

Initial Response Actions:

- Determine the Level of Emergency using the Assessment Matrix in **Section 1: Initial Response**.
- Determine spilled substance. If it can be classified as an LPG release, isolate the area to a minimum distance of 1600 meters (1 mile) and refer to the BLEVE portion of the fire / explosion section.
- Assess spill hazards and risks. Determine what PPE will be required.

Considerations:

- Are there any nearby public (workers, traffic, residents) that would need to be evacuated or diverted from the spill area?
- Is there a fire or explosion hazard? What is the ignition source?
- Is there H_2S or other toxins present? Are concentrations safe or is additional PPE needed?
- Are there any areas deemed hazardous? (Mark with flags)
- What are the ground and weather conditions? (Snow, gravel, sand etc.)
- Where is the location of the leak, the type of release and the volume released? Is it reportable? Has it been reported to the regulator?
- How long has the spill been taking place?
- Are air monitoring trailers required?
- Is the spill into a watercourse, watershed or a water body?
- Is the spill contained or migrating? Which direction? How far can it go?
- If the spill is not contained, determine and prioritize the containment points and methods to be used.
- What lands or water bodies may be affected? (Farm, livestock, brush, drinking water, etc.)
- How is it going to be contained and cleaned up?
- How to access the spill site, the source of the spill and recovery points?
- What equipment is required? Is oil spill equipment (oil spill co-op) required?
- Where can spill responders park so as not to interfere with spill equipment? (Minimize vehicular traffic as much as possible at the spill site.)
- Are there any residences in the area? Do they have water wells that could be affected?
- Should the spill site be cordoned off to prevent wildlife / livestock from entering?
- Will a media response be required?

Spill Response, continued

Control/Containment

- Remove all sources of ignition.
- Stop the spill if safely possible (e.g. shut off pump, replace cap, tip drum upward, patch leaking hole). Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so.
- Assess speed and direction of spill and cause of movement (water, wind and slope).
- Use contents of spill kits to place sorbent materials on the spill, or use shovel to dig to contain spill. Methods may vary depending on the nature of the spill.
- Prioritize and set up containment points.
- Where possible, prevent a spill from entering a watercourse.
- Have a contingency plan ready in case spill worsens beyond control or if the weather or topography impedes containment.
- Avoid excessive walking or driving on the spill area.
- Consider ground disturbance guidelines.
- Surface run off may have to be diverted from the spill site if wet conditions are present.
- Mitigate or eliminate any danger to life, health, the environment or property arising from the spill.
- Ensure the health and safety of the persons responding to the spill.
- Once containment has been achieved, recovery and clean-up operations begin immediately.
- Recover as much product and saturated debris as possible.
- Keep environmental disturbance to a minimum.
- Take steps to rehabilitate any land affected by the spill.
- Take steps to prevent the occurrence of a similar spill.

External Notifications

- Follow notification procedures outlined at the beginning of this section as per the applicable provincial Petroleum Industry Release Reporting Requirements chart.
- Contact the applicable spill service (below) to determine the closest available spill equipment and towing requirements.

SWAT Consulting	866-610-7928
Clean Harbors (Fort Nelson)	800-645-8265

Spill Response, continued

Spill Control Points

Control points are pre-identified locations on watercourses that allow for the staging and deployment of oil spill containment and recovery equipment in response to oil spills that have occurred upstream of the control point. Control point selection is critical to an effective oil spill response and part of your risk assessment and development of site-specific emergency response plan information.

An ideal control point should have:

- Quick access to the watercourse in all seasons, using clear ground, a road or a trail
- Adequate work space to conduct operations and to store required equipment with minimal need for clearing of brush and vegetation
- Sufficient space to deploy containment and recovery equipment quickly with minimal effort or obstructions (i.e. trees, rocks, steep banks, etc.) and minimal environmental impact
- Boat launch location(s) for boats assisting in containment and recovery operations.

Selection of control points with public access is preferred.

For control points on private property - landowner approval and necessary permits for emergency access should be obtained in advance.

Designated site specific control points need to be reviewed at least annually. Each control point site should be visited periodically to evaluate suitability and to ensure information is accurate and complete. Old unsuitable control points should be removed and new control points added, as a part of revisions to site specific information, as required. Control point listings should include a site description, site diagram, access description, landowner/occupant phone number, site suitability and any other information related to the site.

Action

Where a spill occurs, the person who had possession immediately before the spill shall take all reasonable and practical action. They should have due regard for the safety of the public, themselves, to stop and contain and minimize the effects of the spill.

Provincial oil and gas regulations require operators to take immediate steps to contain and clean up spilled upstream petroleum product. Upstream petroleum product refers to crude oil, salt water, emulsions, condensates, sour gas natural gas liquids and / or any combination of the materials listed that are generated during exploration and production activities.

Spill Response, continued

Recovery Techniques

There are two basic means of stopping the flow of petroleum products floating on a stream or river: a boom or a dam. If the stream or river if relatively large, booms are used. A dam may be constructed across the channel of a small stream with a low flow.

If a stream or river is to be boomed, the appropriate equipment should be obtained from the Local Spill Response Cooperative or mutual aid partners. Decisions must incorporate the following considerations:

- Width of stream or river to be boomed (where possible, the entire river width should be boomed)
- Allowable boom angle based on stream or river current and length of boom required
- Anchoring methods for the booms
- Methods to lay out and deploy a boom

If a dam is to be constructed across the stream, some allowance must be made for the flow of water past the dam. The Western Canadian Spill Services plan provides detailed information about oil spill containment and recovery.

Containment and Storage of Product

When commercial barriers are not suitable or available, particularly in remote areas, barriers must be improvised. Improvising depends on the materials at hand and the situation in which the spill occurred. In each case, the experience and innovative ability of the personnel at the spill site is needed for the successful containment of the oil spill.

Tank trucks, storage tanks or an earthen pit may be used to store recovered petroleum products. Access must be close enough to the recovery site so that hoses from the pumps can reach a tank truck. Storage tanks must be located on level, stable ground with access available for tank truck use. An earthen pit should only be constructed when tank trucks or storage tanks cannot be used. Earth-moving equipment and appropriate ground disturbance procedures will be required to construct a pit. A plastic lining should be used.

Disposal and Remedial Operations

Disposal of the product and site restoration actions will be determined for each site by consultation among operations personnel, the provincial environmental protection agency or other environmental regulators and any external contracted professional environmental consultants.

It is the company's responsibility when reporting a release to the regulatory agency or the Ministry of Environment (as appropriate) to inform any private individuals whose lands may be affected by the release. The company must notify the landowner of any release that occurs off a lease site, migrates off a lease site or occurs on an easement or right-of-way. The company is reminded that landowner cooperation is essential in being able to quickly respond to a release that is not on the normal working area of a lease site.

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

Government of Northwest Territories | Nunavut | Canada | Inuvialuit Land Administration

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 Time:**	**Remarks:**
Lead Agency:			
First Support Agency:			
Second Support Agency:			
Third Support Agency:			

CENTRAL MACKENZIE VALLEY REGION

24 HOUR EMERGENCY: 1-866-362-1138 / 403-290-3600

FACILITY & FIELD CONTACTS

Primary Field Contact
Heenan Energy Services 403-818-4408
Rich (Dick) Hennan

Alternate Field Contact
Zedi Solutions Dispatch 250-500-2287
4404 - 55 Street Daytime: 250-774-6216
Fort Nelson, BC V0C 1R0

PARAMOUNT RESOURCES CONTACTS

Dir. Operations & Maintenance
Shane Haroldson Office: 403-817-5122
Cell: 403-819-7796

VP, Operations & Production
Cody Dziadek Office: 403-817-5049
Cell: 403-844-7645

HSE Manager
Jim White Office: 403-261-1205
Cell: 403-813-0910

Paramount Resources' EM Coordinator
Lona Loeppky-Hickman Office: 403-206-3835
Cell: 587-998-6627

SURFACE DEVELOPMENT INFORMATION

Surface Development Information has not been gathered for this region. In the event of an incident, assign rovers to patrol the region.

April 2019
www.h2safety.ca

Courier / Mailing Address:
Suite 2800, 421 - 7 Ave SW
Calgary, AB T2P 4K9

LEAD AGENCIES & PRIORITY CONTACTS

Note: All numbers, unless otherwise indicated, are 24 hours.

Office of the Regulator of Oil and Gas Operations (OROGO)
867-445-8551
Yellowknife Office Admin: 867-767-9097

Sahtu Land and Water Board - Fort Good Hope 867-598-2413

Sahtu Health and Social Services (HSS) Authority
Daytime: 867-587-3650
After Hours: 877-415-6735

Sahtu Regional District - Norman Wells Admin: 867-587-7100

Northwest Territories Emergency Measures Organization (NWT EMO)
867-920-2303

Environment and Natural Resources (ENR)
NWT/Nunavut Spill Reporting Line 867-920-8130
Sahtu Regional Office - Norman Wells 867-587-3500
Sahtu Deline Office 867-589-3421
Sahtu Fort Good Hope Office 867-598-2271
Sahtu Tulita Office 867-588-3441

First Nations*
Behdzi Ahda First Nation Band - Colville Lake Band Office
Daytime: 867-709-2200
Tulita - Band Dene 867-588-3341
*The above First Nations are not directly impacted by any asset or buffer zone; they are just in the area.

Worker's Safety & Compensation Commission (WSCC)
Admin: 800-661-0792

Northwest Territories Power Corporation 855-575-NTPC
(855-575-6872)

Department of Transportation (DOT) - Inuvik Highway Operations
867-777-7314

Emergency Response Assistance Canada (ERAC) 800-265-0212
(ERAP #: ERP2-0010-193)

CANUTEC 613-996-6666
Toll-Free 888-226-8832
From Cell Phone *666
Information 613-992-4624

Indigenous and Northern Affairs Canada (INAC)
Yellowknife (NWT Region) 867-669-2500

Environment & Climate Change Canada
Meteorological Services 800-667-8676

Department of Fisheries and Oceans - Arctic 800-889-8852
Inuvik 867-777-7500
Hay River 867-875-5300

Wildfire Reporting Line 877-NWT-FIRE
(877-698-3413)

Wildlife Emergencies - Norman Wells 867-587-2422

SAFETY EQUIPMENT

All required equipment will be available on-site and strategically located prior to the commencement of any operations and as required.

AREA USERS & TIE-INS

Note: All numbers, unless otherwise indicated, are 24 hours.

No area users or tie-ins points have been identified within any of the well 100 m EPZs.

EMERGENCY SERVICES

Note: All numbers, unless otherwise indicated, are 24 hours.

****There are no 911 services available due to the remote Region. Please call number listed.****

RCMP
Norman Wells 867-587-5111
Tulita 867-588-1111

Fire Departments
Tulita 867-588-2222
Norman Wells 867-587-2222
Sahtu Office of the Fire Marshal 867-587-7115

MEDEVAC (Ambulance)

No communities in the Sahtu region operate a community-based ground ambulance service, a highway ambulance, or a rescue service.

The Tulita Airport operates weekdays 9am to 5pm local time but does operate outside of its operational hours when responding to MEDEVAC call out.

The Stanton Territorial Health Authority co-ordinates medevac services for the Territory.

Note: Air medevac using NWT resources must be arranged through the local Health Center in conjunction with the on-call physician at Stanton Territorial Hospital. The medevac then must leave from Yellowknife. This can result in a delay of 4-6 hours.

Hospitals
Sahtu Got'ine Regional Health & Social Services Centre - Norman Wells
867-587-6688
Colville Lake Health Centre 867-709-2409
Harriett Gladue Health Centre - Tulita 867-588-3333

The above health centres are well equipped, however major medical emergencies require transportation to hospital services outside of the Region.

Stanton Territorial Hospital - Yellowknife 867-669-4111

Poison Center NWT Wide 800-332-1414

** Due to the vast remoteness of the region, response times from any emergency service could be very lengthy (6 - 18 hrs). It is highly

OPERATIONS SUMMARY

The Central Mackenzie Valley Region consists of sweet wells that are currently suspended, with plans for abandonment.

EPZ Information

The H_2S concentrations for the wells is 0%; however, an EPZ of 100 m has been assigned to each well.

On-Site Storage

There is no on-site storage within the region.

Closest Urban Centre

The Hamlet of Tulita is located approximately 20 km north of the closest well-site and has a population of +/- 477 (not all are permanent).

The Town of Norman Wells is located approximately 74 km northwest the of closest well-site and has a population of +/- 778 (not all are permanent).

The Settlement of Colville Lake is located approximately 50 km southwest of the closest well-site and has a population of +/- 129 (not all are permanent).

Hydrology

There are numerous streams and water bodies within the region including Mackenzie River, Great Bear Lake, Colville Lake, Lac Maunoir, Lac Des Bois, Lac Belot, as well as various unnamed waterbodies and creeks.

Highways

No highways run through the region. There are secondary and access roads throughout the region, but none come into contact with any assets or EPZs.

Site Access

All but one of the wells are in the vicinity of Colville Lake and accessible only by helicopter. Coleville Lake itself is accessible only by air (fixed wing) in the summer, and also by a long winter road from Norman Wells.

SUPPORT SERVICES

Note: All numbers, unless otherwise indicated, are 24 hours.

Mobile Air Monitoring
HSE Integrated - Central Dispatch 888-346-8260
Firemaster Oilfield Services - Central Dispatch 877-342-3473

Oilfield Fire Fighting / Safety Contractors
HSE Integrated - Central Dispatch 888-346-8260
Superior Fire Control - Grande Prairie 877-882-0035
Safety Boss - Central Dispatch 800-882-4967

Well Control Specialists
Capstone Blowout Recovery (Boots & Coots - Houston*) 866-347-3911
**Paramount has a contract with Boots & Coots. Capstone runs the Canadian version of Boots & Coots.*
Bravo Target Safety - Central Dispatch 866-513-3779
Safety Boss - Central Dispatch 800-882-4967

Ignition Services
HSE Integrated- Central Dispatch 888-346-8260
Safety Boss - Central Dispatch 800-882-4967

Spill Response
SWAT Consulting 866-610-7928
Clean Harbors - Fort Nelson 250-233-8811

Security
Scarlet Security Services - Yellowknife 867-873-3202

Emergency Response Management
H_2Safety Services Inc. - Calgary 403-212-2332
Toll Free 888-216-2332

Reception Centres / Operations Base
Mackenzie Mountain Inn (Trumpeter Camp) 867-322-6092
After Hours 867-322-6095
Two Rivers Hotel 867-588-3320
Heritage Hotel - Norman Wells 867-587-5000
Sahtu Dene Inn 867-587-2511
Colville Lake Lodge 867-709-2500

Air Traffic Control
NAV Canada 866-992-7433

Helicopter Companies *Not for Medical Services*
Summit Helicopters - Yellowknife 855-355-5527
Canadian Helicopters - Norman Wells (Day Flying Only) 780-429-6900
Sahtu Helicopters - Central Dispatch 867-873-2081

Air Freight
Canadian North Cargo - Norman Wells 888-663-2223
Buffalo Airways - Yellowknife 867-873-6112

Fixed Wing
North Wright Air - Norman Wells 867-587-2288
Air Tindi - Yellowknife 867-669-8200

Winter Trucking
Manitoulin Transport - Norman Wells Admin: 867-587-2351

Summer Barging
Manitoulin Transport - Norman Wells Admin: 867-587-2351
Marine Transportation Services - Hay River 844-574-2023

Construction Services / Trucking
HRN Contracting - Norman Wells Admin: 867-587-2168
Northridge Contracting Ltd. Admin: 867-587-2050

** Due to the vast remoteness of the region, response times from any service company could be very lengthy (4 - 24 hrs).

Prior to the commencement of any operations, an assessment should be made for any potential equipment that may be needed and brought to the site before any work begins. **

BEHDZI AHDA FIRST NATION
COLVILLE LAKE
COLVILLE LAKE WATER AERODROME
COLVILLE LAKE AIRPORT
LAC BELOT
LAC DES BOIS
100m EPZ
C-49
M-17
K-14
B-23
FORT GOOD HOPE FIRST NATION
FORT GOOD HOPE
FORT GOOD HOPE AIRPORT
GREAT BEAR LAKE
FORD BAY AIRPORT
FORD BAY WATER AERODROME
MACKENZIE RIVER
NORMAN WELLS
NORMAN WELLS AIRPORT
NORMAN WELLS WATER AERODROME
DELINE FIRST NATION
DELINE
DELINE AIRPORT
DELINE WATER AERODROME
TULITA
TULITA DENE FIRST NATION
TULITA AIRPORT
I-78
SAHTU HSS AUTHORITY
SAHTU REGIONAL DISTRICT
RCMP - NORMAN WELLS
LAC MAUNOIR
E-35
C-34

CENTRAL MACKENZIE VALLEY REGION

NORTHWEST TERRITORIES ERP

mgm ENERGY

Draft Date: March 2, 2018 FSC

Revision Date: April 16, 2019 PGK

Scale: 1:1,000,000 | Map: 7191

UTM ZONE 10 NAD83

0 10 20 30 40 50 (km)

H2Safety

AREA OVERVIEW MAP

1:15,000,000

INUVIK
INSET
RECEPTION CENTRE
NUNAVUT
COLVILLE LAKE
CENTRAL MACKENZIE VALLEY REGION
FORT GOOD HOPE
NORMAN WELLS
DÉLINE
RECEPTION CENTRE
TULITA
NORTHWEST TERRITORIES
RAE
YELLOWKNIFE
0 50 100 200 (km)

- Third Party Well
- Drilling Well
- Suspended Gas Well
- Suspended Well
- Third Party Pipeline
- Other Roads
- Winter Road
- Main Hwy
- Divided Hwy
- Railway
- Hydrology
- Waterbody
- Urban Area
- Airstrip
- Occupied
- First Nations
- Urban Area
- Land Claim (Sahtu Lands)
- Health and Social Services Authority
- Local Authority
- RCMP
- EPZ

DESCRIPTION OF NWT GRID SYSTEM

EXAMPLE F-25 / 60-10N, 123-15W

GRID: 60-10N, 123-15W

SEC

80	70	60	50	40	30	20	10
79	69	59	49	39	29	19	9
78	68	58	48	38	28	18	8
77	67	57	47	37	27	17	7
76	66	56	46	36	26	16	6
75	65	55	45	35	25	15	5
74	64	54	44	34	24	14	4
73	63	53	43	33	23	13	3
72	62	52	42	32	22	12	2
71	61	51	41	31	21	11	1

UNIT

M	N	O	P
L	K	J	I
E	F	G	H
D	C	B	A

Central Mackenzie Valley Region - Wells

CURRENT LICENSEE	OPERATING COMPANY	WELLNAME	LICENSE NO.	UWI	LATITUDE (NAD 83)	LONGITUDE (NAD 83)	H2S (%)	EPZ (m)	LICENSED STATUS
PARAMOUNT RESOURCES / MGM SWEET SUSPENDED									
MGM ENERGY CORP	MGM ENERGY CORP	MGM ET AL NOGHA M-17	1970	300M176640125452	66.6126	-125.8105	0	100	SUSPENDED
MGM ENERGY CORP	MGM ENERGY CORP	MGM NOGHA B-23	1998	300B236640125452	66.5350	-125.8279	0	100	SUSPENDED
MGM ENERGY CORP	MGM ENERGY CORP	MGM NOGHA C-49	1934	300C496640125451	66.6350	-125.8952	0	100	SUSPENDED
MGM ENERGY CORP	MGM ENERGY CORP	MGM EAST MACKAY I-78	2078	300I786450125301	64.7951	-125.7235	0	100	SUSPENDED
MGM ENERGY CORP	MGM ENERGY CORP	MGM WEST NOGHA K-14	2006	300K146640126001	66.5610	-126.0528	0	100	SUSPENDED
PARAMOUNT RESOURCES LTD.	MGM ENERGY CORP	APACHE PARAMOUNT LAC MANOIR C-34	1995	300C346720125001	67.2174	-125.1178	0	100	SUSPENDED
PARAMOUNT RESOURCES LTD.	MGM ENERGY CORP	APACHE PARAMOUNT LAC MANOIR E-35	2021	300E356720125001	67.2410	-125.1231	0	100	SUSPENDED

LEGEND

Other: UWI=Unique Well Identifier

INCIDENT NOTIFICATION PROTOCOL [1]

	Negligible (1)	Minor (2)	Serious (3)	Major (4)	Critical (5)
Health & Safety	• No illness or adverse effect. • Medical treatment is not necessary. • Injury requiring First Aid treatment	• Minor illness or adverse effect with limited or no impacts on ability to function • Multiple First Aid Injuries • Medical Aid Injury	• Serious illness or adverse effects with mild to moderate functional impairment • Injury requiring modified work • Multiple Modified Work Injuries • Multiple Medical Aid Injuries	• Major illness or chronic exposure resulting in long term effects. • Medical treatment for exposure to toxic substance (i.e. H_2S) • Lost Time Injury • Injury resulting in long term disability or disfigurement • Potential Serious Injury or Fatality (SIF)	• Critical illness or chronic exposure resulting in fatality or significant life shortening effects. • Fatality or fatalities • Multiple Lost Time Injuries • Life Threatening physical assault or threat
	** Potential Serious Injury or Fatality (SIF) = MAJOR (4)				
Assets	• Negligible asset loss or damage to facility resulting in costs <$50K	• Minor asset loss or damage to facility resulting in costs >$50K but <$250K	• Serious asset loss, damage to facility resulting in costs >$250K but <$500K	• Major asset loss or damage to facility resulting in costs >$500K but <$2M • Declaration of a Level 1 emergency as defined by the regulator	• Critical asset loss or damage to facility resulting in costs >$2M • Declaration of a Level 2 or 3 emergency as defined by the regulator
Environment [2]	• Tier 4[2] • Liquid release contained on lease (<2m^3) • Liquid release extends beyond lease (<0.1m3) • Gas release on lease (<30,000 m^3) • Negligible environmental impact	• Tier 3[2] • Liquid release contained on lease ($\geq$ 2m^3 but < 10 m^3) • Liquid release extends beyond lease ($\geq$0.1m3 but < 2m3) • Gas release on lease ($\geq$ 30,000 m^3 but < 100,000 m^3) • Gas release off lease (< 30,000 m^3) • Public, wildlife or worker health/safety are not in jeopardy • Response requiring on-site resources • Minimal environmental impact	• Tier 2[2] • Liquid release contained on lease ($\geq$10m^3 but < 100m^3) • Liquid release extends beyond lease ($\geq$2m3 but < 10m3) • Gas release off-lease ($\geq$ 30,000 m^3 but < 100,000 m^3) • Public, wildlife or worker health/safety could be jeopardized • Response requiring local resources	• Tier 1[2] • Liquid release contained on lease ($\geq$ 100 m^3) • Liquid release extends beyond lease ($\geq$ 10m^3) • Gas release on or off lease ($\geq$100,000m^3) • Response requiring regional resources • Single wildlife impact	• Tier 1[2] with Fire / Explosion • Liquid release into Waterbody or sensitive habitat • Release extends beyond lease – public health/safety are jeopardized. • Release impacting a sensitive species • Release requiring long term response and remediation effort • Multiple wildlife impacted
Reputation	• Regulatory enforcement action not likely • Non-conformance to internal procedures or requirements • Individual concern • No Media attention	• Regulatory enforcement action (fines < $100K) • Short term community concern	• Regulatory enforcement action (fines > $100k but < $1M) and or criminal charges laid	• Regulatory enforcement action (fines > $1M but <5M) and or criminal charges laid • Close regulatory scrutiny of Asset level operations / future proposals • Local Media coverage or social media coverage • Major interest group concern • Short term regional concern	• Regulatory enforcement action (fines > $5M) and or criminal charges laid • Negative national publicity • Negative impact on market share or investor valuation • Major venture / asset operations severely restricted

[1] This document is to be used as a quick reference guide only and is not a controlled document. The contents are excerpted from Paramount Incident Management Governance Document. Any revisions must be made within the Governance document before being reflected here. The intent is to be used for internal incident notification purposes only; emergency response plan is to be used when responding to emergencies. **First determine if this is an Emergency or Incident response – IS THE SITUATION UNDER CONTROL? If not, initiate Emergency Response Plan.**

[2] For Tier categorization or Regulatory Reportable Thresholds, consult with local Safety or Environmental Advisor and Corporate HSE team

Notification Timing based on Actual[1] Incident Severity

Operations		Drilling/Completions		Engineering Facilities Construction		HSE		Actual Incident Severity				
Notification By:	Notification To:	Notification By:	Notification To:	Notification By:	Notification To:	Notification By:	Notification To:	Negligible	Minor	Serious	Major	Critical
Worker	Supervisor/ Foreman	Worker	Site Supervisor	Worker	Site Supervisor			Immediate [2]	Immediate [2]	Immediate [2]	Immediate [2]	Immediate [2]
Foreman	Ops Manager **&** Safety or Environment Advisor	Site Supervisor	Superintendent & Safety or Environment Advisor	Site Supervisor (Inspector)	PM. & Safety or Environment Advisor			Within 24 hrs	Immediate	Immediate	Immediate	Immediate
Ops Manager	Ops Director	Superintendent	D&C Director	PM	Facilities Manager			WDS	Within 24 Hrs	Within 8 Hrs	Immediate	Immediate
						Safety or Environment Advisor	Health & Safety Manager OR Environment Team Leader	NBD	Within 24 Hrs	Immediate	Immediate	Immediate
						Health & Safety Manager OR Environment Team Leader	HSE Director	WDS	Within 24 Hrs	Within 8 Hrs	Immediate	Immediate
Ops Director	Ops VP			Facilities Manager	Eng. VP	HSE Director	EVP Ops	WDS	NBD	Within 8 Hrs	Immediate	Immediate
Ops VP	EVP Ops **&** CEO	D&C Director	EVP Ops & CEO	Eng. VP	EVP Ops & CEO			WDS		Within 24 Hrs	Within 8 Hrs	Immediate

Notes:
1 – Notification requirements based on actual severity (or potential SIF)
2 – "Immediate" incident notification occurs after physical response steps to bring the event to a safe state
WDS – Weekly Data Summary
NBD – Next Business Day (Mon-Fri)

Initial Internal Notification Requirements

Include the following information when providing initial notifications:

Reporting / Responsible Region:			
Date:		**Time:**	
Event Type:		**Actual Severity:**	
Potential SIF:	☐ Yes ☐ No	**Location:**	
Reason for SIF Classification:		**Nearest Municipality:**	
		Person Involved:	Name
		Position	Position
☐ Employee ☐ Contractor		Company Name	

Description of incident (What, where, when, how):
Action Taken:
Actual and Potential Impacts:
People:
Environment:
Assets / Operational Impact:
Reputation:
Regulatory:
Reported to Government Agency?

Who:		Contact Number:		Time:	

What information was provided:

Appendix D: Mackenzie Spill Response Corporation Container

CATEGORY	ITEM	DESCRIPTION	C1	C2	C3	C4	C5	C9	C15	C17	C18	C53	C54	TR1	TR2	REMARKS
ANCHORS, BUOYS, CHAINS, PARAVANES & HULL MAGNETS	ANCHORS	Danforth 25 lb. c/w chain & caribiner at chain end and on crown plate									4					Container 7 is being used by Shell and is currently in Camp Farewell. As of August 2019, the container had not been returned to the MDSRC storage yard and was not inventoried in 2019
ANCHORS, BUOYS, CHAINS, PARAVANES & HULL MAGNETS	ANCHOR PINS	Drive- in , 4'									4					6 K ea
ANCHORS, BUOYS, CHAINS, PARAVANES & HULL MAGNETS	BUOYS	A-1 (small)											2			2 K
BOOMS, BRIDLES, CONNECTOR PINS & BOOMVANE	BARRIER, CONTAINMENT	ROC Rapid containment 1,000'												1	1	
BOOMS, BRIDLES, CONNECTOR PINS & BOOMVANE	BOOMS, RIVER	6" x 6" River Boom (Red) in 50' sections with fixed ASTM connectors and 10' folds											100			120 lb per 50' section x 20 sections in Boom Box. Gross wt. 1100 kg per box
BOOMS, BRIDLES, CONNECTOR PINS & BOOMVANE	BOOMS, RIVER	ShoreSaver Boom in 50' sections										2				38 K ea
BOOMS, BRIDLES, CONNECTOR PINS & BOOMVANE	BRIDLES	Shoreline, c/w snaps for 6" x 6" boom.									3					2 kg
BOOMS, BRIDLES, CONNECTOR PINS & BOOMVANE	BRIDLES	Tow, Double, ASTM Connector for 6" x 6" boom									6					One on each paravane incl.
ELECTRICAL EQUIPMENT & GENERATORS	EXTENSION CORDS	50'	2	3	3	2	1							2	2	
ELECTRICAL EQUIPMENT & GENERATORS	EXTENSION CORDS	100'	1	2	1	2	1							1	1	6 K ea
ELECTRICAL EQUIPMENT & GENERATORS	GENERATORS (Gasoline)	Kodiak Gas Model SGB5500HX	1													C1 Ser. C007858 90K PM OK Sep. 10
ELECTRICAL EQUIPMENT & GENERATORS	GENERATORS (Gasoline)	Kodiak Gas Model SGB5500HX		1												C2 Ser. C008127 90K PM OK Sep. 10
ELECTRICAL EQUIPMENT & GENERATORS	GENERATORS (Gasoline)	Honda Gas Mod. EB3800X			1							1				C3 Ser. EAJC 1005579 PM OK Sep. 10
ELECTRICAL EQUIPMENT & GENERATORS	GENERATORS (Gasoline)	Honda Gas Mod. EB3800X				1										C4 Ser. EAJC 1005578 PM OK Sep. 10
ELECTRICAL EQUIPMENT & GENERATORS	GENERATORS (Gasoline)	Honda Gas Mod. EB3800X					1									C5 Ser. EAJC 1005580 PM OK Sep. 10
ELECTRICAL EQUIPMENT & GENERATORS	GENERATORS (Gasoline)	Honda 2000w												1		Need serial #
ELECTRICAL EQUIPMENT & GENERATORS	GENERATORS (Gasoline)	Honda 2000w													1	Need serial #
ELECTRICAL EQUIPMENT & GENERATORS	LIGHT STAND	Portable, c/w light	2		2	2	1							2	2	
ELECTRICAL EQUIPMENT & GENERATORS	LIGHTS, HAND	Portable, 500W Halogen		1	1	1	1							1	1	
ELECTRICAL EQUIPMENT & GENERATORS	LIGHTS, HAND	Spare 500W Halogen bulbs	1													
ELECTRICAL EQUIPMENT & GENERATORS	PLUG	Twist Lock 20A/125/250V	1													
FUEL, GAS, OIL, LUBES & ADDITIVES	ANTI - FREEZE	Gas Line 150 mL	2	1		1	1									
FUEL, GAS, OIL, LUBES & ADDITIVES	DIESEL	5 gall. Jerry Can	1	1	1	1	1						1			Some diesel cans are stored empty, while others have fuel. C2 jerry can needs lid replaced.
FUEL, GAS, OIL, LUBES & ADDITIVES	ENGINE STARTING FLUID	Aerosol	1	1	1	1	1				1					
FUEL, GAS, OIL, LUBES & ADDITIVES	GASOLINE	5 gall. Jerry Can	1	1	1	1	1		1				2	1	1	Some gas cans are stored empty, while others have old fuel.
FUEL, GAS, OIL, LUBES & ADDITIVES	GASOLINE (5L)/CHAIN OIL (1.5L) Combi Container	GASOLINE (5L)/CHAIN OIL (1.5L) Combi Container	1	1	1	1	1									Pre-mix and chain oil new Sep. 06. Should be replaced.
FUEL, GAS, OIL, LUBES & ADDITIVES	OIL	W5-30 1Qu.		1												1 K ea
FUEL, GAS, OIL, LUBES & ADDITIVES	OIL	10W30 x 1L							1							
FUEL, GAS, OIL, LUBES & ADDITIVES	PROPANE BOTTLES	20lb												2	2	Filled July '05 (Inuvik) *Check expiration Dates
HOSES & RELATED EQUIPMENT	ADAPTER	1 1/2" M x 2" M						1								
HOSES & RELATED EQUIPMENT	ADAPTER	1 1/2" M x 2" M												1	1	
HOSES & RELATED EQUIPMENT	DISCHARGE HOSE	2" x 25' c/w Kamlocks						6			1					9kg
HOSES & RELATED EQUIPMENT	DISCHARGE HOSE	2" x 50' c/w Kamlocks						6								18 K
HOSES & RELATED EQUIPMENT	FIRE NOZZLE	c/w 1 1/2" to 2" Swage c/w Kamlocks						1								
HOSES & RELATED EQUIPMENT	FOOT VALVES	2" c/w Kamlock						3								
HOSES & RELATED EQUIPMENT	HOSE CAPS	1.5"						Y								
HOSES & RELATED EQUIPMENT	HOSE CAPS	2"						Y								
HOSES & RELATED EQUIPMENT	HOSE CAPS	3"						Y								
HOSES & RELATED EQUIPMENT	HOSE CAPS	4"						Y								
HOSES & RELATED EQUIPMENT	HOSE PLUGS	1.5"						Y								
HOSES & RELATED EQUIPMENT	HOSE PLUGS	2"						Y								
HOSES & RELATED EQUIPMENT	HOSE PLUGS	3"						Y								
HOSES & RELATED EQUIPMENT	HOSE PLUGS	4"						Y								
HOSES & RELATED EQUIPMENT	KAMLOCK LOCKING PINS (spare)	Spares						Y								
HOSES & RELATED EQUIPMENT	KAMLOCKS, NIPPLES & ADAPTERS etc	Many and varied						Y								
HOSES & RELATED EQUIPMENT	KAMLOCK SEALS	2" Rubber, Spares						8								
HOSES & RELATED EQUIPMENT	SUCTION HOSES	2" x 17' c/w Kamlocks						5			1					
HOSES & RELATED EQUIPMENT	SUCTION HOSES	2" x 25' c/w Kamlocks						6								
HOSES & RELATED EQUIPMENT	SUCTION HOSES	2" x 50' c/w Kamlocks						1								
HOSES & RELATED EQUIPMENT	SUCTION HOSES	2" x 100' c/w Kamlocks						2								
HOSES & RELATED EQUIPMENT	SUCTION SCREEN	2" c/w Kamlocks						2								Requires mesh installation
HOSES & RELATED EQUIPMENT	SWAGES	1 1/2" - 3" c/w Kamlocks						1								
HOSES & RELATED EQUIPMENT	SWAGES	2" - 3" c/w Kamlocks						2								
HOSES & RELATED EQUIPMENT	SWAGES	2" - 4" c/w Kamlocks						2								
HOSES & RELATED EQUIPMENT	THREE WAY MANIFOLD	2"						2								
HOSES & RELATED EQUIPMENT	TOTE DRAIN ASSEMBLY	Spares						2								
HOSES & RELATED EQUIPMENT	TOTE DRAIN ADAPTERS	1.5" Spares						12								
HOSES & RELATED EQUIPMENT	VALVES	2" Ball, c/w Kamlocks						2								Plus those with most Totes
SPILL KITS	Kit 1	poly clear 120 x 1000							1							Stored in C15
SPILL KITS	Kit 1	banana knife							1							
SPILL KITS	Kit 1	long handled square mouth shovels							1							
SPILL KITS	Kit 1	long handled spade shovel							1							
SPILL KITS	Kit 1	steel ended rakes							1							
SPILL KITS	Kit 1	aluminum scoop							1							
SPILL KITS	Kit 1	disposalbe vinyl gloves							1							
SPILL KITS	Kit 1	one tonne tote bags							1							
SPILL KITS	Kit 1	duct tape 50mm x 55mm							1							
SPILL KITS	Kit 1	garbage bags (large)							1							
SPILL KITS	Kit 1	Silicon caulking							1							
SPILL KITS	Kit 1	caulking gun							1							
SPILL KITS	Kit 1	white oil pads sonic bonded 3/8x15"x18"							1							
SPILL KITS	Kit 1	white oil boom 5"x10' 4/bag							1							
SPILL KITS	Kit 1	oil gator 1.5 cu ft bag							1							
SPILL KITS	Kit 1	ROC rapid oil containment barrier 1000'							1							
SPILL KITS	Kit 1	mini basin 4'x4'x4" 44 gal capacity							1							
SPILL KITS	Kit 1	Bio solve							1							
SPILL KITS	Kit 1	decontamination brush							1							
SPILL KITS	Kit 1	hand sprayer							1							
SPILL KITS	Kit 1	25 lb box rags							1							
SPILL KITS	Kit 1	roll of 20 garbage bags (30.5" x 38" 2 mil)							1							
SPILL KITS	Kit 1	reusable nitrile gloves (15 mil, 13" (012-31510)							1							
SPILL KITS	Kit 1	reflector safety chemical splash goggles RME #315							1							
SPILL KITS	Kit 1	size 9 Bata CSA rubber boots							1							
SPILL KITS	Kit 1	size 10 Bata CSA rubber boots							1							

CATEGORY	ITEM	DESCRIPTION	C1	C2	C3	C4	C5	C9	C15	C17	C18	C53	C54	TR1	TR2	REMARKS
SPILL KITS	Kit 2	poly clear 120 x 1000							1							Stored in C15
SPILL KITS	Kit 2	banana knife							1							
SPILL KITS	Kit 2	long handled square mouth shovels							1							
SPILL KITS	Kit 2	long handled spade shovel							1							
SPILL KITS	Kit 2	steel ended rakes							1							
SPILL KITS	Kit 2	aluminum scoop							1							
SPILL KITS	Kit 2	disposalbe vinyl gloves							1							
SPILL KITS	Kit 2	one tonne tote bags							1							
SPILL KITS	Kit 2	duct tape 50mm x 55mm							1							
SPILL KITS	Kit 2	garbage bags (large)							1							
SPILL KITS	Kit 2	Silicon caulking							1							
SPILL KITS	Kit 2	caulking gun							1							
SPILL KITS	Kit 2	white oil pads sonic bonded 3/8x15"x18"							1							
SPILL KITS	Kit 2	white oil boom 5"x10' 4/bag							1							
SPILL KITS	Kit 2	oil gator 1.5 cu ft bag							1							
SPILL KITS	Kit 2	ROC rapid oil containment barrier 1000'							1							
SPILL KITS	Kit 2	mini basin 4'x4'x4" 44 gal capacity							1							
SPILL KITS	Kit 2	Bio solve							1							
SPILL KITS	Kit 2	decontamination brush							1							
SPILL KITS	Kit 2	hand sprayer							1							
SPILL KITS	Kit 2	25 lb box rags							1							
SPILL KITS	Kit 2	roll of 20 garbage bags (30.5" x 38" 2 mil)							1							
SPILL KITS	Kit 2	reusable nitrile gloves (15 mil, 13" (012-31510)							1							
SPILL KITS	Kit 2	reflector safety chemical splash goggles RME #315							1							
SPILL KITS	Kit 2	size 9 Bata CSA rubber boots							1							
SPILL KITS	Kit 2	size 10 Bata CSA rubber boots							1							
MISCELLANEOUS	ALLEN KEY	Set	1	1			1							1	1	
MISCELLANEOUS	AXES	Fire, Long Handled	1	2	1	2	2							1	1	See also "Pulaskis" this section
MISCELLANEOUS	BOOSTER CABLES	Pr.	1	1			1									
MISCELLANEOUS	BRUSH	Floor, Long Handled	1	1	2		1	1			1					
MISCELLANEOUS	CHAINSAW	Makita 400 Model	1													C1 DCS400 Ser. 9875294 6K PM OK Sep.08
MISCELLANEOUS	See also Chain Saws in Ice Equipment	Husquvarna Model 340 c/w bar sleeve				1										C4 Ser. 3301768 PM OK Jul. '09
MISCELLANEOUS	See also Chain Saws in Ice Equipment	Husquvarna Model 340 c/w bar sleeve					1									C5 Ser. 3301785 PM OK Sep. 08
MISCELLANEOUS	CHAIN SAW CHAPS	Chaps	1		1											
MISCELLANEOUS	CLIPBOARD	Clipboard	1	2	2	2	2	1			1					
MISCELLANEOUS	COME ALONG 3/4 TON	C/W chain and lever														Serial No. 5173
MISCELLANEOUS	CONES, TRAFFIC	Traffic	10	15	11	10	10							4	4	
MISCELLANEOUS	CORD	Sash on reel	1		1	1	1				1					
MISCELLANEOUS	DECON	Brushes	2	2	2	2	2									
MISCELLANEOUS	DECON	Trays	3	3	3	3	3									
MISCELLANEOUS	Bag, Duffle, Marked "Decon Kit"	Bag, Duffle, Marked "Decon Kit"											1			
MISCELLANEOUS	3 Bags, Waste Disposal	3 Bags, Waste Disposal														
MISCELLANEOUS	3 Berms, Mini 36" x 36" x 6"	3 Berms, Mini 36" x 36" x 6"												3	3	
MISCELLANEOUS	DELINEATION KIT TUB	DELINEATION KIT TUB	1	1	1	1	1									
MISCELLANEOUS	DETERGENT	20L pail *NOTE: These are out of date and should be considered for replacement	1	1	1		1									
MISCELLANEOUS	DRILL,ELECTRIC	Corded Master Craft												1	1	
MISCELLANEOUS	DRILL BIT SET	246 pce Set												1	1	
MISCELLANEOUS	DRUM, 45 gall, steel	45 Gall. c/w removable lid	1	3	5	3	3									Contains sorbent. Sorbent included in SORBENTS totals. #1 has drum on Smart Ash Burner
MISCELLANEOUS	DRUM, 45 gall, plastic	45 Gall. c/w removable lid	5	5	1	3	3							4	4	Contains sorbent. Sorbent included in SORBENTS total
MISCELLANEOUS	EMERGENCY RESPONSE GUIDE 2008	EMERGENCY RESPONSE GUIDE 2008	1	1	1	1	1									
MISCELLANEOUS	FENCE	Snow, Orange	1	1	1									1	1	
MISCELLANEOUS	FIELD DESK	RubberMaid, c/w log book, pencils & document supply	1	1		1	1									
MISCELLANEOUS	FILES	FILES	3	1		2										
MISCELLANEOUS	FLASHLIGHTS	c/w Orange Wand Ends & "D" Cell batteries											2			Batteries new January 2009
MISCELLANEOUS	FUNNELS	Large	2	1	1	1	2									
MISCELLANEOUS	FUNNELS	Medium														In Flammables Compartment
MISCELLANEOUS	FUNNELS	Small	1	1	1	1		1								8 K
MISCELLANEOUS	GARBAGE BAGS	Box		1		1				1						
MISCELLANEOUS	GARBAGE BAGS	Roll							2							
MISCELLANEOUS	GARBAGE BAGS, INDUSTRIAL WASTE	6mm 50 per box					1				50					
MISCELLANEOUS	GEO TECH BAGS	Solid Waste, Heli Transportable c/w slings attached									3					Max. Gross Wt.of Bags 3000 lb. Bags inside tote T19.
MISCELLANEOUS	HACKSAW	c/w spare blades		2		1	1							1	1	
MISCELLANEOUS	HAMMER	Ball Peen	1	1		1	1							2	2	
MISCELLANEOUS	HAMMER	Claw	1	1		1	1							1	1	
MISCELLANEOUS	HAMMER	Mawl														
MISCELLANEOUS	HAMMER	Sledge 6 lb														
MISCELLANEOUS	HAMMER	Sledge 8 lb.	2	1		1		1								
MISCELLANEOUS	HAMMER	Sledge 14 lb		1		1										
MISCELLANEOUS	HEATER	"Reddy", Electric powered, Diesel fuel	1													C1 Ser. 95377757 46 K PM OK Sep. 08 Fueled July 2006 PM
MISCELLANEOUS	HEATER	"Reddy", Electric powered, Diesel fuel		1												C2 Ser. 5986877 46K PM OK Sep. 08 Fueled July 06 PM
MISCELLANEOUS	HEATER	"Reddy", Electric powered, Diesel fuel			1											C3 Serial WP061D0SW PM OK Sep. 08
MISCELLANEOUS	HEATER	"Reddy", Electric powered, Diesel fuel				1										C4 Serial WP061D0TK PM OK Sep. 08
MISCELLANEOUS	HEATER	"Reddy", Electric powered, Diesel fuel					1									C5 Serial WP061D0TC PM OK Sep. 08
MISCELLANEOUS	KIT, GROUNDING & BONDING	Rubbermaid Tub c/w Lid	1	1		1	1									Added Sep.08
MISCELLANEOUS	KIT, GROUNDING & BONDING	Steel Spikes	2	2			2									
MISCELLANEOUS	KIT, GROUNDING & BONDING	15' Yellow Coated Cable c/w BLACK clamp each end	2	2			2									
MISCELLANEOUS	KIT, GROUNDING & BONDING	25' Yellow Coated Cable c/w RED clamp on each end	1	1			1									
MISCELLANEOUS	KIT, GROUNDING & BONDING	Instruction Card for use of	1			1	1									
MISCELLANEOUS	KNIFE	Utility, c/w spare blades				1					1			1	1	
MISCELLANEOUS	KNIFE	Banana														
MISCELLANEOUS	LAB SPILL KIT (in 20L Pail c/w Lid)	LAB SPILL KIT (in 20L Pail c/w Lid)		1	1	1	1									
MISCELLANEOUS	LADDER	Step 6'											1			
MISCELLANEOUS	LANTERNS	Hand		5		6								6	6	
MISCELLANEOUS	NAILS	Assorted, In One Gallon Paint can	1		1	1	1									
MISCELLANEOUS	PADLOCKS	Installed on units. Combination type, Programmable, Master Locks on doors.	2	2	1	1	2	1	1	1	1	Do not close properly but are locked	Do not close properly but are locked			In 2019, all locks in Inuvik have the code 5656. There are 6 extra locks stored in C16. Containers in Norman Wells have the code 6565. There are 10 extra locks stored in C4. There are 5 extra locks in C18
MISCELLANEOUS	PADLOCKS	Combination type, Programmable, Spare Master Lock				10 extra			7		5 extra					
MISCELLANEOUS	PAILS	Galv. 2.5 gall, aluminium	1	1	1	1	1				1					
MISCELLANEOUS	PAILS	Plastic, 20L c/w lid	2	1	2	1	2									
MISCELLANEOUS	PAINT	Aerosol - Orange	4	3	3	3	2				2					
MISCELLANEOUS	PAINT	Aerosol - White									1					
MISCELLANEOUS	PAINT	Aerosol - Blue														
MISCELLANEOUS	PAINT STICKS	For marking tools							1							
MISCELLANEOUS	PAPER TOWELS															
MISCELLANEOUS	PICK		1	1	1	1	1						1			
MISCELLANEOUS	PIPE SEALANT	Tubes, "Lock-Tite"						2								
MISCELLANEOUS	PITCH FORKS	"D" Grip		1	2	1	2									
MISCELLANEOUS	PLIERS	Regular	1	1		1	1							1	1	
MISCELLANEOUS	PLIERS	Needlenose	1	1		1	1							1	1	
MISCELLANEOUS	PLIERS	Adjustable	1											1	1	
MISCELLANEOUS	PLYWOOD	3/4 x 4' x 8'				1										
MISCELLANEOUS	PLYWOOD	4' x 4'			1											#14 Plywood used as tween decks for storage of sorbents
MISCELLANEOUS	PLYWOOD	5' x 3'			1											
MISCELLANEOUS	Poly 120 x 1000	Poly 120 x 1000												1	1	
MISCELLANEOUS	PROPANE TORCH KIT	c/w storage case, flame spreader, 2 utility flame tips.														

CATEGORY	ITEM	DESCRIPTION	C1	C2	C3	C4	C5	C9	C15	C17	C18	C53	C54	TR1	TR2	REMARKS
MISCELLANEOUS	PRY BAR	5'	2	2	2	2	2					1				
MISCELLANEOUS	RAGS (BOX)	RAGS (BOX)												1	1	
MISCELLANEOUS	RAKES	Long Handled		2	3	2								1	1	
MISCELLANEOUS	RAPID DEPLOYMENT SPILL KITS 1 & 2 in ALUMINIM TOTES	Details of each at end of Inventory							2							
MISCELLANEOUS	SCRAPER	Ice	2	2	2	2										
MISCELLANEOUS	SCREWDRIVER	Flat Blade, Large	1	1			1							2	2	
MISCELLANEOUS	SCREWDRIVER	Multi tip	1											2	2	
MISCELLANEOUS	SHELVING	Chrome mobile shelving										yes				
MISCELLANEOUS	SHOVELS	"D" Grip												1	1	
MISCELLANEOUS	SHOVELS	Long Handled	2	2	1	1	1							3	3	
MISCELLANEOUS	SHOVELS	Scoop, Aluminum, "D" grip	4	3	1	4	4						1			
MISCELLANEOUS	SHOVELS	Snow	2	2	2	2	1									
MISCELLANEOUS	SHRINK WRAP	SHRINK WRAP														
MISCELLANEOUS	SIGNS	Caution			2		1									
MISCELLANEOUS	"SMART ASH" BURNER	c/w oil injector pump & manual	1	1	1	1	1									Model 108076. On wheeled trolley. Pump in C8 awaiting new unit. Note: Drum may be filled with new sorbents. Drums included in steel drum totals
MISCELLANEOUS	"SMART ASH" BURNER BASE	"SMART ASH" BURNER BASE	1			1	1									122 kg ea.
MISCELLANEOUS	"SMART ASH" FILTERS	Spares	Y	Y	Y	Y	Y									
MISCELLANEOUS	SMART ASH PUMP	Electric	1			1	1									
MISCELLANEOUS	SPARK PLUG	Spark Plugs		1												
MISCELLANEOUS	SQUEEGEE	Long Handled	2	2	2	2	2						1			
MISCELLANEOUS	TAPE	CAUTION	1	2	1	1	1				1					in Delineation kit
MISCELLANEOUS	TAPE	DANGER	1	1		1	1									in Delineation kit
MISCELLANEOUS	TAPE	Duct	3	2	2	2	2				2					
MISCELLANEOUS	TAPE	Electrical (Rolls)	1				1									
MISCELLANEOUS	TAPE	Flagging (rolls)	1	1		1	1									
MISCELLANEOUS	TAPE MEASURE	25'	1				1							1	1	
MISCELLANEOUS	TAPE MEASURE	50'	1													
MISCELLANEOUS	TAPE MEASURE	100'		1												
MISCELLANEOUS	TAPE MEASURE	150'				1	1				1					
MISCELLANEOUS	TARPAULINS	TARPAULINS	2	2		2	2				3					
MISCELLANEOUS	TIES, CABLE, NYLON	TIES, CABLE, NYLON							Y		1					3 different sizes
MISCELLANEOUS	TIE-DOWNS	Various types in all containers and shop. Not being counted									11					48 new ratchet type placed in shop Sep. 08. In 3 Home Depot pails c/w lids
MISCELLANEOUS	TIN SNIPS	TIN SNIPS	3	3		3	3		3		3					
MISCELLANEOUS	TIRE PRESSURE GAUGE	TIRE PRESSURE GAUGE														
MISCELLANEOUS	TOOL BOX	"Greenlees", fixed in container. Contents listed separately in this inventory									1					From C7
MISCELLANEOUS	TOOL BOX	Portable	1	1		1	1									
MISCELLANEOUS	TOOL KIT	Multi (72 Piece)	1													
MISCELLANEOUS	TRAYS, DRIP	36" x 36" x 4"									3					
MISCELLANEOUS	WD - 40	Lubricant, aerosol				1				1	1			1	1	
MISCELLANEOUS	WIRE	Mechanics (roll)	1	1		1	1									
MISCELLANEOUS	WOODEN PLANKS	2" x 8" x 8'							18							
MISCELLANEOUS	WIRE CUTTERS	WIRE CUTTERS	1	1		1	1				1			2	2	
MISCELLANEOUS	WIRE FLAGS	Bundles	1	1	1	1	1							1	1	
MISCELLANEOUS	WRENCH	Crescent 8"		1										1	1	
MISCELLANEOUS	WRENCH	10"		1			1							1	1	
MISCELLANEOUS	WRENCH	12"	1								1					
MISCELLANEOUS	WRENCH	Pipe - 12"		1							1			1	1	
MISCELLANEOUS	WRENCH	14"												1	1	
MISCELLANEOUS	WRENCH	18"	1	1		1	1									
MISCELLANEOUS	WRENCH	24"	1			1	1	1			1					
MISCELLANEOUS	WRENCH	Combination Open End Set 11, imperial					1							1	1	
MISCELLANEOUS	WRENCH	Combination Open End Set 11, metric					1							1	1	
MISCELLANEOUS	WRENCH	20 pce 3/8" SAE					1									
MISCELLANEOUS	WRENCH	17 pce 3/8" Metric Socket	1	1												
MISCELLANEOUS	WRENCH	57 piece SAE/Metric Socket	1													
PUMPS	GASOLINE	Honda trash												1	1	Need Serial Number
ROPES & ROPE REELS	ROPE	1/2" x 50' thimble one end									1					4 K
ROPES & ROPE REELS	ROPE	100' yellow rope									1			1	1	
ROPES & ROPE REELS	REEL	Rope, Metal									2					
SAFETY EQUIPMENT - GENERAL	AIR HORN	AIR HORN	1	1	1	1	1				1					
SAFETY EQUIPMENT - GENERAL	AIR HORN REFILL	AIR HORN REFILL	1	1	1	1	1				1					
SAFETY EQUIPMENT - GENERAL	EMERGENCY KIT	Roadside *NOTE: Some items are out of date and should be replaced									1		1	1	1	
SAFETY EQUIPMENT - GENERAL	FIRST AID KIT	10 man #3 *NOTE: Some items are out of date and should be replaced	1	1	1	1	1				1					Serviced/Replenished June 2015
SAFETY EQUIPMENT - GENERAL	FIRE EXTINGUISHER	20lb ABC, N2 Refillable 2019-09-08 *NOTE: Some items are out of date and should be replaced			2	2	2	1			1					
SAFETY EQUIPMENT - GENERAL	FIRE EXTINGUISHER	Plus 1 FE taken from boat when N2 installed. Details to be added.							2							Serviced July 09
SAFETY EQUIPMENT - GENERAL	FIRE EXTINGUISHER	10lb type unknown							1							Serviced date unknown
SAFETY EQUIPMENT - GENERAL	N2 FIRE EXTINGUISHER BRACKET	N2 Type	2	2		2	2	2			2					
SAFETY EQUIPMENT - GENERAL	POWDER, FIRE EXTINGUISHER	Purple K - 50lb Pails *NOTE: Some items are out of date and should be replaced	1	1	1	1	1									
SAFETY EQUIPMENT - PERSONAL	BLANKETS	Blankets	2	2		2	2									
SAFETY EQUIPMENT - PERSONAL	BOOTS, WINTER	Baffin -Size 9	1	1		1	2									
SAFETY EQUIPMENT - PERSONAL	BOOTS, WINTER	Baffin -Size 10	1	1		1	1									
SAFETY EQUIPMENT - PERSONAL	BOOTS, WINTER	Baffin -Size 11	1	1		1	1									
SAFETY EQUIPMENT - PERSONAL	COVERALLS, DISPOSABLE, TYVEC	Size XL											1 box			
SAFETY EQUIPMENT - PERSONAL	COVERALLS, INSULATED	Size XL				4										
SAFETY EQUIPMENT - PERSONAL	GLASSES	Safety									4	1		5	5	
SAFETY EQUIPMENT - PERSONAL	GOGGLES	Safety	4	5	4	4	4						1	2	2	
SAFETY EQUIPMENT - PERSONAL	GLOVES	Chemical resistant "Barrier", pr.												6	6	
SAFETY EQUIPMENT - PERSONAL	GLOVES	Latex 12"	2	4	4		4				1					
SAFETY EQUIPMENT - PERSONAL	GLOVES	Monkey Grip	10	10	10	10	10						2			
SAFETY EQUIPMENT - PERSONAL	GLOVES	Neoprene														
SAFETY EQUIPMENT - PERSONAL	GLOVES	Nitrile, Disposable (Box of 100)				1	1									
SAFETY EQUIPMENT - PERSONAL	GLOVES	Nitrile, reusable,pr												24	24	
SAFETY EQUIPMENT - PERSONAL	HAND CLEANER	Gojo 4L												1	1	
SAFETY EQUIPMENT - PERSONAL	HARDHATS	Hardhats	2	2		2	2				3		22			Hardhats replaced in 2015
SAFETY EQUIPMENT - PERSONAL	ICE SANDALS	"Korkeez", pr	4	4	4	4	4				4					
SAFETY EQUIPMENT - PERSONAL	INSECT REPELLANT	"Deep Woods Off", Aerosol *NOTE: Some items are out of date and should be replaced	1	1		1	1									
SAFETY EQUIPMENT - PERSONAL	RAINWEAR	Extra Large	4	4		4	4									
SAFETY EQUIPMENT - PERSONAL	SAFETY HARNESS	Parachute Type c/w 6' shock absorber safety lines									2					
SAFETY EQUIPMENT - PERSONAL	SUNSCREEN	Tubes *NOTE: Items are out of date and should be replaced	2	2	2	2	2									
SAFETY EQUIPMENT - PERSONAL	VESTS	Road, c/w reflective tape	6	5		5	5									
SAFETY EQUIPMENT - PERSONAL	VESTS	Incident Commander									1					
SAFETY EQUIPMENT - PERSONAL	VESTS	Deputy Incident Commander									2					
SAFETY EQUIPMENT - PERSONAL	VESTS	Safety Officer/Representative									2					
SAFETY EQUIPMENT - PERSONAL	VESTS	Ops. Crew Chief									5					
SAMPLING EQUIPMENT	Cooler, 102 quart, white	Cooler, 102 quart, white											3	1	1	
SAMPLING EQUIPMENT	Cooler, 60 quart, red/white	Cooler, 60 quart, red/white											2			
SAMPLING EQUIPMENT	Pen	Pen											1 box			

CATEGORY	ITEM	DESCRIPTION	C1	C2	C3	C4	C5	C9	C15	C17	C18	C53	C54	TR1	TR2	REMARKS
SKIMMERS	MULTI-HEAD	Canadyne Model 1230D									1					Powerpack & Hoses 275K Serviced June 2015
SKIMMERS	MULTI-HEAD	Yanmar 10 hp diesel powerpack									1					PM Check in June 2015, new hydraulic fluids
SKIMMERS	MULTI-HEAD	S2T2 Hydratech discharge pump									1					Serviced June 2015
SKIMMERS	MULTI-HEAD	Drum Insert for Multi-Head									1					Serviced June 2015
SKIMMERS	MULTI-HEAD	Brush Insert for Multi-head									2					
SKIMMERS	MULTI-HEAD	Skimmer disc hose 25'									2					5K
SKIMMERS	MINI SKIMMER	MINI SKIMMER												1	1	
SKIMMERS	HONDA PUMP	HONDA PUMP												1	1	
SORBENTS	BOOMS, Oil Only (White)	Sorbent, Bags of 4 (8" x 10')	1	2		3	6					23		3	3	#5 = 7 booms in super sack
SORBENTS	BOOMS, Universal (Gray)	Sorbent, Bags of 4 (8" x 10')		2	1	1	1					7				
SORBENTS	GRANULAR	granular	6	8	9	8	8									
SORBENTS	OIL GATOR	1.5 cu. Ft bag												1	1	
SORBENTS	OIL SNARES, LOOSE	Pom Poms 30 per bag	2	2	2	2	2					13				
SORBENTS	OIL SNARES ON ROPE	Pom Poms 1 rope per bag	1	1	1	1	1									
SORBENTS	PADS	100 Bale, Oil Only (White) in Tote	16	22	19	15	12						20	19	19	
SORBENTS	PADS	200 Bale, Oil Only (White)	1	2		2	1									
SORBENTS	PADS	100 Bale,Universal (Gray)	4	5	4	3	3					55	1	5	5	
SORBENTS	PUTTY, SPILL	Jar, for drum and tank leaks	1	1	1		1									
SORBENTS	ROLLS	Sorbent, Oil Only	2	2		2	2					5				
SORBENTS	SOCKS	Bags in tote	2	2		2										
SORBENTS	SPILL KIT, BATTERY ACID	SPILL KIT, BATTERY ACID												1	1	
SORBENTS	SAWDUST	Bags	4	8	8	8	7						0.5			
SPILL KITS	Overpack Spill Kits	Overpack with sorbents, shovels etc.												1	1	
TOTES	TOTES 11-27 c/w Lids & Drain Assemblies	#11	1											1		
TOTES	TOTES 11-27 c/w Lids & Drain Assemblies	#12		1												
TOTES	TOTES 11-27 c/w Lids & Drain Assemblies	#13													1	
TOTES	TOTES 11-27 c/w Lids & Drain Assemblies	#14				1										
TOTES	TOTES 11-27 c/w Lids & Drain Assemblies	#15					1									
TOTES	TOTES 11-27 c/w Lids & Drain Assemblies	#20								1						
TOTES	TOTES 11-27 c/w Lids & Drain Assemblies	#25								1						
TOTES	TOTES 11-27 c/w Lids & Drain Assemblies	#27								1						
TOTES	TOTE, 113.7 L	TOTE, 113.7 L							1							
VEHICLES	Kubota RTV 2012, 400ci side by side	c/w 2" trailer ball hitch & pin							1							Need serial number, Steering shaft needs replacing; spare parts and instructions already received (DO need new battery in 2019).
VEHICLES	TRAILER, BOAT	EZ - Loader (Harbercraft)														License Expires Aug. 2011 Registration in Docs. Tube.
VEHICLES	TRAILER, TILT DECK	for use with RTV. c/w planked deck							1							Need Serial Number
TOTES	T14	T14														
MISCELLANEOUS	Garbage Bags															
MISCELLANEOUS	SAFETY	Fire Extinguishers								1						
SORBENTS	BLANKETS	Roll								1						
MISCELLANEOUS	Peat Moss	Bag of compressed peat moss							3							

Appendix E: MSDS Sheets

Health, Safety and Environment Policy

Paramount Resources Ltd. ("Paramount") is committed to a culture where prevention of incidents that may cause harm to people, property loss, or an adverse impact on the environment is of the highest importance.

We believe that promoting operational discipline and consistency as detailed in the Paramount Operational Excellence Management System **(POEMS)** is of critical importance in fulfilling our commitments in the areas of health, safety, and environmental protection. Our commitments include:

Worker Health and Safety: We will endeavor to ensure that all work performed for Paramount is done so in a safe manner by competent workers using appropriate equipment. It is a requirement that work should only proceed once hazards have been identified and appropriate controls put in place to prevent or minimize any potential incidents or loss.

All employees and contractors conducting work for Paramount have the right to stop or refuse work that they consider to be unsafe or environmentally irresponsible, without fear of repercussion.

Environmental Protection: We are committed to achieving a high standard of environmental stewardship. We ensure that environmental protection is an integral component of our decision making by identifying the potential environmental impacts associated with our activities and taking prudent actions to prevent and minimize these impacts and reduce our environmental footprint.

Regulatory Compliance: We are committed to complying with all applicable Federal and Provincial laws and regulations and recognized industry standards and practices. Individuals who violate applicable laws and regulations will be held responsible for their actions.

Continuous Improvement: Incidents and potential incidents are reported and analyzed to determine causes, and identify corrective actions and shared learnings, in order to reduce the risk of recurrence. We review the adequacy and effectiveness of all our policies, processes, programs, and procedures on a regular basis to ensure they remain appropriate and up to date.

Paramount believes that its interests and those of its stakeholders, including the communities in which we operate, are best served by diligently applying the principles, practices, and procedures set out in POEMS in all of our operations, and we will take steps to ensure that everyone working for Paramount supports and conducts themselves in accordance with this management system.

Chairman and President and Chief Executive Officer

January 2021