APPENDIX A:
GENERAL SPECIFICATIONS FOR MARINE AND AERIAL SUPPORT VESSELS

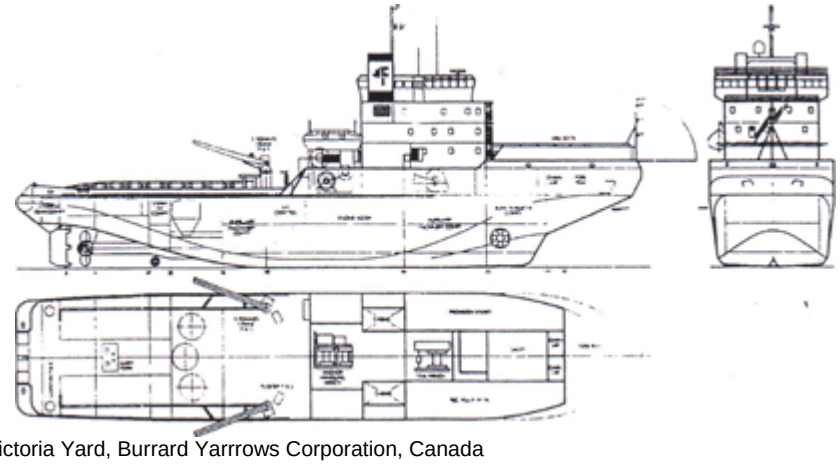
1. **MARINE VESSELS IN SUPPORT OF BEAUFORT EXPLORATORY DRILLING PROGRAM**
2. **AERIAL SUPPORT OF BEAUFORT EXPLORATORY DRILLING PROGRAM**

1. MARINE VESSELS IN SUPPORT OF BEAUFORT EXPLORATORY DRILLING PROGRAM

LIST OF MARINE VESSELS IN SUPPORT OF BEAUFORT EXPLORATORY DRILLING PROGRAM

	M.V. *KULLUK*	***FRONTIER DISCOVERER***
Anchor-handling	***Tor Viking***	Nordica
Ice-management	***Vladimir Ignatyuk***	Kapitan Dranitsyn
oil spill response Platform:		
	OSRV	Crowley Pt. Barrow Arctic Tug
		Barge *Arctic Endeavor*
Oil spill response work boats:		
	(2) 34-foot *Kvichak* workboats	**(4) 34-foot Kvichak workboats**
		(1) 47-foot Kvichak workboat w/ brush skimmer
Other:		
	Misc. short-term support Vessels (crew changes, supplies, etc.)	**Misc. short-term support Vessels (crew changes, supplies, etc.)**

The *Vladimir Ignatyuk* Diesel Icebreaker



Wharf - builder: Victoria Yard, Burrard Yarrrows Corporation, Canada
.

Purpose: Multifunctional icebreaker-tow

Class: Lloyd's Register of Shipping + 100 A1 Icebreaker Tug + LMC
Lloyd's Register of Shipping 100 A1 LMC, icebreaking tow, ice class - 1A Super

Max. length: 88.02 m

Width: 17.51 m

Draught: 8.3 m

Deadweight capacity: 2,113 t

Displacement: 7,077 t

Main engine: Two-shaft diesel-reduction gear engine with 4 main engines and variable-pitch propeller.
GD type - 8TM410, Stork Werkspoor Diesel

Capacity of engine: 4 x 5,800 h/p

Maximal speed in clear water: 15.5 knots

Navigation area: unlimited

Vessel Owner: Murmansk Shipping Company

The *Kapitan Dranitsyn* Diesel-Electric Icebreaker

Apart from her main activity – cargo ships piloting on the routes of the Northern Sea route, the *Kapitan Dranitsyn* icebreaker participates in tourist voyages in high polar latitudes. Since 1994, the voyages to Frants Joseph's Archipelago, Spitsbergen, New Land, and Chukotka, to Bering Strait and even to the North Pole were carried out. The *Captain Dranitsyn* made the first around-the-world voyage in 1996 and brought 665 passengers around the Earth. Also, in 1996, the icebreaker participated in a rescue operation. As a result of nautical fault, the German passenger *HANSIATIK* motor ship was in low water. There were 135 passengers aboard. The maximal number of passengers the *Captain Dranitsyn* could manage (128 people) were taken off the motor ship.

In 2000, the icebreaker made the Arctic around-the-world voyage on the following route Hammerfest (Norway), Keflavik (Iceland), Stromfiord (Greenland), Canadian Arctic regions, Alaska, Chukotka and Murmansk. In 2002, the icebreaker participated in the research expedition of the in the Laptev Sea with the University of Alaska (USA) and with the Ecoshelf company (St.-Petersburg), researching the sea bottom shelf.

In the summer of 2002, the *Captain Dranitsyn* participated in shooting an advertising film for the Ford company in the area of the Spitsbergen Archipelago.

For all voyages the vessel transported about 5,000 passengers from more than 40 countries.

The *Captain Dranitsyn* is the only icebreaker in the world certified as passenger carrier, according to the international standards.

Displacement	12,228 tons
Power	24,000 hp
Length	131.00 m
Width	26.50 m
Draft	8.50 m
Cruising Speed	15 knots
Crew	60
Passengers	102

MSV *Nordica* Multi-Purpose Icebreaker

The Fennica-class multipurpose icebreakers built by Aker Finnyards operate during the open water period as global offshore construction vessels.

DNV ID:	17933	IMO No:	9056985
Operational Status:	In Operation	Class Relation:	In DNV Class

Speed: 16 knots
Engine Output: 21,000 kW
Dimensions:

Loa:	116 m	GT (ITC 69):	9,088
Lbp:	96.7 m	NT (ITC 69):	2,727
Lload:		DWT:	1,650
Lwl:			
Bext:		GT (pre 69):	
B:	26 m	NT (pre 69):	
D:	12.5 m	Freeboard:	I
Draught:	8.415 m		

Flag:	Finland	Signal Letters:	OJAE
Port:	HELSINKI		
Owner:	Shipping Enterprise (120131)	GT (ITC 69):	9,088
		NT (ITC 69):	2,727
Manager:	Shipping Enterprise (120131)	DWT:	1,650
Yard:	Finnyards Ltd.(104590)	Year of Build:	1994
Type:	630 – Supply Vessel/Tug		
Class Notation:	✠1A1 POLAR Icebreaker Tug Supply Vessel SF HELDK EPR E0 DYNPOS-AUTR		
Register Information:	bp 227 dat(-30oC) dk(+) ern(99,99,99) ram		

MSV *Tor Viking II* Multi-purpose Icebreaker

DNV ID:	21779	IMO No:	9199622
Operational Status:	In Operation	Class Relation:	In DNV Class

Speed: 16 knots – Abt. 42.7 MT

Engine Output: 13,440 kW

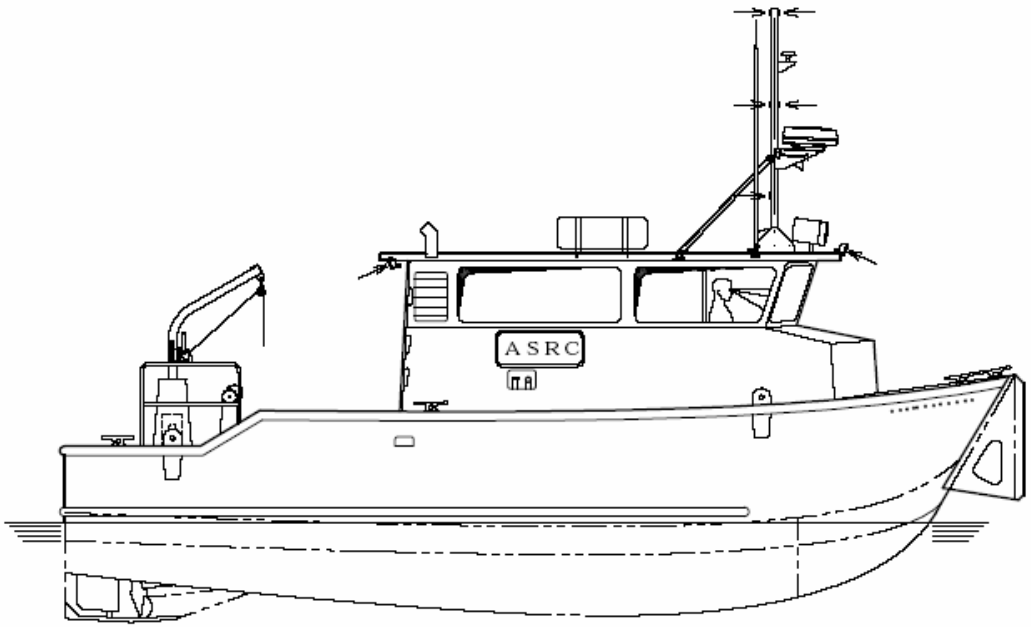
Dimensions:

Loa:	83.7 m	GT (ITC 69):	3,382
Lbp:	77.76 m	NT (ITC 69):	1,145
Lload:	75.1 m	DWT:	2,528
Bext:	18 m	GT (pre 69):	
B:	18 m	NT (pre 69):	
D:	8.52 m	Freeboard:	
Draught:	7.2 m		

Flag:	Sweden	Signal Letters:	SLJT
Port:	SKÄRHAMN		
Owner:	Transviking Icebreaking & Offshore AS	GT (ITC 69):	3,382
	(189468)	NT (ITC 69):	1,145
Manager:	Viking Supply Ships AS Kristiansand, Norway	DWT:	2,600
	(191173)		
Yard:	Havyard Leirvik A.S.(108910)	Year of Build:	2000
Type:	630 - Supply Vessel/Tug		
Class Notation:	✠1A1 ICE-05 Icebreaker Tug Supply Vessel SF HELDK-SH E0 DYNPOS-AUTR NAUT-OC DK(+) HL(2.8)		

Kvichak 34-foot Oil Spill Response Work Boat

SPECIFICATIONS
LWL: ~31'-7"
LOA: ~34'-2"
BEAM: ~12'
DRAFT: ~55"
DISPLACEMENT: ~24,000LBS
FUEL: 300 GALLONS
MAX SPEED: 18KN
ENGINES: (2) CUMMINS
QSB @ 305HP EA.
GEAR: TWIN-DISC V-DRIVE
CONFIG. OR SIMILAR
GENSET: (1) ~8kW
EXHAUST: DRY W/
MUFFLER
COOLING: KEEL COOLED



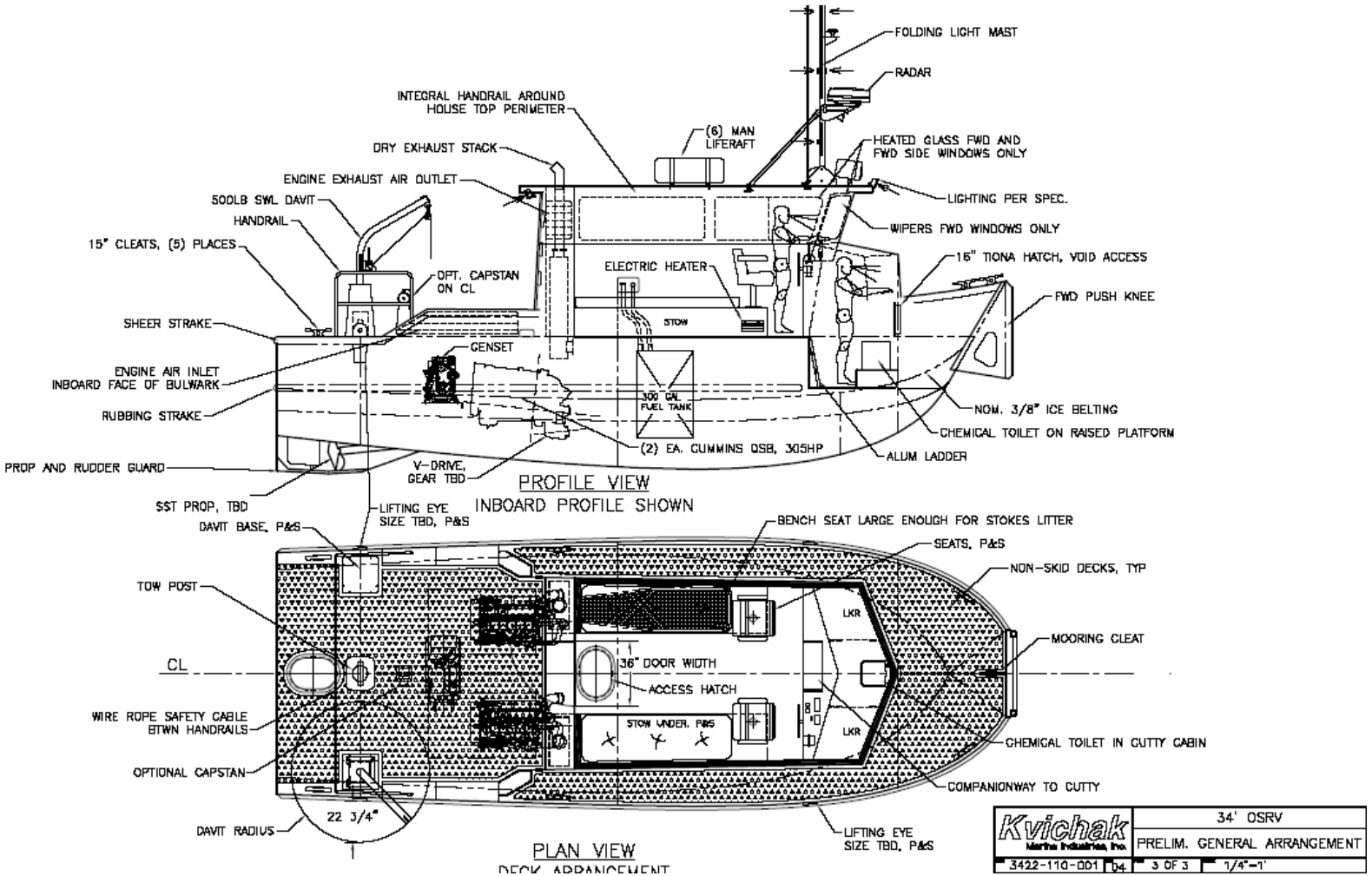
BL

OUTBOARD PROFILE
REFER TO DETAILS ON
FOLLOWING PGS

ALL DIMENSIONS FOR REFERENCE ONLY

Kvichak Marine Industries, Inc.	34' OSRV
	PRELIM. GENERAL ARRANGEMENT
3422-110-001 04	2 OF 3 1/4"=1'

Kvichak 34-foot Oil Spill Response Work Boat
General Deck Arrangement



***Kvichak* 47-foot oil spill response Work Boat**
(with Brush Skimmer)

Vessel use:

- Respond quickly to spill site. Recover oil via LAMOR system.
- Operate in shallow water with adequate protection to propellers and rudders.
- Capable of operating in 6- to 8-foot seas.
- Has an approximate 20,000 pounds of bollard pull.
- Able to tow vessels and barges with a maximum weight of 75 gross tons along side, astern, and pushing ahead.
- Capable of slow speed operation for skimming oil via the engine's MGX transmissions.

GENERAL SPECIFICATIONS

LOCATION	SIZE	ALLOY
Bottom	14", 3/8, 1/2"	5086-H116
Sides	3/8"	5086-H116
Transom	3/8"	5086-H116
Decks	3/16"	5052-H32
BHDs	3/16	5086-H116
CVK (Keel)	1/2"	5086-H116
Chine	1/2"	5086-H116
Engine Girders	1/2"	5086-H116
Fuel Tank	1/4", 3/8"	5086-H116
House	3/16"	5052-H32
Bottom Longs	2x2x1/4" Tee Bar	6061-T6
Side Longs	1.5x1.5x3/16" Tee Bar	6061-T6

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2. AERIAL SUPPORT OF BEAUFORT EXPLORATORY DRILLING PROGRAM

GENERAL SPECIFICATIONS
BELL 412 (IFR) TWIN TURBINE HELICOPTER

DIMENSIONS

Length	56' 2"
Width	9' 4"
Height	15' 1"
Main Rotor Diameter	46' 0"

CARGO/BAGGAGE

Tailboom cargo space - 28 cu. ft (400 lbs)
Internal cargo space - 220 cu. ft. with 49" x 92" Sliding doors

SPECIFICATIONS

Maximum gross weight	11,900 lbs.
Average basic weight	7,700 lbs.
External sling load	4,000 lbs.
Fuel capacity	214 gal / 1455 lbs (293 gal. (one aux tank))
Fuel consumption	110 gph/800 pph
Average cruise speed	117 kts/135 mph
Maximum range	252 nm/290 sm with 30 minute fuel reserve
Passenger seats	11 to 13 passengers depending on configuration
Crew	2 pilots

POWER PLANT

Two (2) Pratt & Whitney PT6T-3B engines developing 1,800 SHP derated to a total of 1,350 SHP.

LANDING GEAR

Fixed skid type landing gear with automatic and pilot activated emergency pop-out float system.

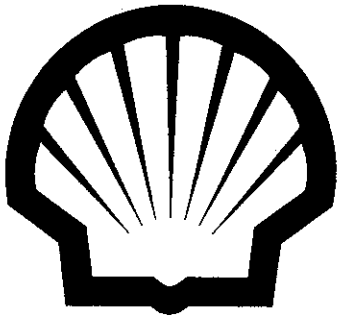
LOADING INFORMATION

Basic weight	7,700 lbs
Full fuel (one auxiliary tank)	1,992 lbs
Pilots (2)	400 lbs
Operating weight	10,092 lbs
Maximum gross weight	11,900 lbs
Minus operating weight	10,092 lbs
Total Payload 1,808 lbs	(full fuel)

PAYLOAD - **Includes 30 minute reserve.*

DISTANCE (roundtrip)	**FUEL REQUIRED***	**PAYLOAD OUTBOUND**	**FLIGHT TIME**
252 nm/269 sm	1,992 lbs.	1,808 lbs.	2.2
200 nm/230 sm	1,657 lbs.	2,143 lbs.	1.7
150 nm/172 sm	1,337 lbs.	2,463 lbs.	1.3
100 nm/115 sm	1,016 lbs.	2,784 lbs.	0.9
50 nm/57 sm	696 lbs.	3,104 lbs.	0.4

APPENDIX B:
CONTRACTUAL TERMS WITH PRIMARY RESPONDERS



SHELL EXPLORATION AND PRODUCTION COMPANY

Oil Spill Response
ASRC Energy Services
AES-Response Operations, LLC
Outline Agreement No. 4610013302

ACCEPTANCE

By signing below, each party signifies that it has carefully examined and agrees to be bound by all terms and conditions that are contained in this Agreement.

Authorized Shell Representative

Signature: Mary Kelly

Name: Mary Kelly

Title: SCM Category Manager

Date: 12/14/2006

Signature: Chandler Anderson

Name: Chandler Anderson

Title: Manager SCM Production

Date: 12/14/2006

Authorized AES Representative

Signature: Bernard Nidowicz

Name: BERNARD NIDOWICZ

Title: President

Date: 1/15/07

MEMBER

RESPONSE ACTION CONTRACT

By and between

ALASKA CLEAN SEAS

AND

SHELL OFFSHORE INCORPORATED

This Response Action Contract is entered into this 30th day of November, by and between Alaska Clean Seas ("ACS"), a non-profit corporation organized and existing under the laws of the State of Alaska, and Shell Offshore Inc. ("MEMBER").

WHEREAS, MEMBER may request from time to time the use of the response services and equipment provided by ACS as a response action contractor in the event of a release or threatened release ("release") of crude oil, hazardous material or refined petroleum products ("liquid hydrocarbons"), or for a drill conducted by any authorized governmental agency ("drill");

NOW, THEREFORE, in consideration of the premises, and in further consideration of the promises below, the parties agree as follows:

1. **Term of Contract.** This Contract is effective the date first written above.

2. **Payment Due Dates.** All invoices submitted by ACS to MEMBER shall be due and payable not more than thirty (30) days after the date the invoice is transmitted to MEMBER, and amounts due shall bear interest at the rate of one percent (1%) per month or portion thereof from the due date until paid. At any time payments are past due, ACS may request and receive from MEMBER adequate security for payments, such as a cash deposit or an irrevocable letter of credit in amount equal to the anticipated costs for one or more months of services to be rendered, or other security satisfactory to ACS. In the event such security is not forthcoming within three (3) days upon request, ACS may decline to provide services for MEMBER under this Contract, and may cease services immediately upon notice to MEMBER.

   In the event ACS and MEMBER cannot agree on any charge or charges made by ACS to MEMBER under this Response Action Contract, MEMBER may withhold up to ten percent (10%) of the disputed charges, only, pending resolution of the dispute. In the event MEMBER withholds more than ten percent (10%) of any billing on account of disputed charges,

F. Amendment: This Response Action Contract may be amended only in writing signed by both parties to the Contract.

G. Entire Understanding. The terms set forth in this Response Action Contract supersede all previous discussions, understandings and agreements between the parties hereto with respect to the subject matter hereof, and are intended by the parties as a final, complete and exclusive expression of the terms of their agreement and may not be contradicted, explained or supplemented by evidence of any prior agreement, any contemporaneous oral agreement or any additional terms.

H. Conflicts. This Response Action Contract is to be interpreted in harmony with the ACS Bylaws. In the event of a conflict between the provisions of this Contract and the ACS Bylaws, the terms of the ACS Bylaws shall control.

IN WITNESS WHEREOF, the parties have signed this Response Action Contract, effective the date first written above.

ACS		MEMBER	
ALASKA CLEAN SEAS		Shell Offshore Inc.	
Signature:	L.D. [illegible]	Signature	Mary Kelly
Name:	L.D. (Lindy) Theis	Name:	Mary Kelly
Title:	Secretary/Treas	Title:	SCM Category Manager
Date:	Dec 12, 2006	Date:	11/10/06

Phone: 504.728.6101
Fax: 504.728.0608
Email: mary.kelly@shell.com

Susan M Moore
Susan M Moore
Alaska Operations Manager
11/30/06
mobile: 907-382-5472
Office: 907-770-3700
Email: Susan.S.M.moore@shell.com

STATEMENT OF CONTRACTUAL TERMS
OSRV

VESSEL REQUEST ORDER

This VESSEL REQUEST ORDER is entered into the 9th day of May, 2006, between Shell Offshore, Inc. ("SHELL") and EDISON CHOUEST OFFSHORE, LLC ("CONTRACTOR"), owner of the vessel described below ("VESSEL").

Pursuant to the terms of that Master Marine Transportation Services Agreement entered into as of the 6th day of December, 1995 between Shell Offshore, Inc. and Edison Chouest Offshore, Inc. to be modified to include special provisions for Arctic and oil spill recovery operations, the premises and covenants of which the parties hereto are familiar with and incorporate herein by reference, CONTRACTOR agrees to and does hereby time charter and SHELL agrees to and does hereby hire the VESSEL subject to the following.

CONTINGENT LIABILITY PERIOD

Contingent Liability Period	May 8, 2006 to June 1, 2006

CONTINGENT LIABILITIES

- The additional costs to be incurred by CONTRACTOR between Monday, May 8, 2006, and Thursday, June 1, 2006 is $1,110,000.00. This amount is represented below as follows:
  - Gearboxes - $80,000.00
  - Wheels and Hubs - $50,000.00
  - Low Temp Steel - $900,000.00
  - Engineering - $80,000.00
- If Shell does not commit to time charter the below described vessel for a primary term of three (3) years prior to Thursday, June 1, 2006, the above noted $1,110,000.00 will be for the account of Shell.
- ECO will use its best efforts to reduce contingent liabilities to a minimum.

VESSEL DESCRIPTION

Vessel Name	**Artic Oil Spill Recovery/PSV TBN** (Hull 240)
Official Number	TBA
Principal Dimensions	301'6" x 60' x 24'
Horsepower	7,200 BHP
Deck Space	203' x 50.5'
Main Engines	(2) 3608 Caterpillar

STATEMENT OF CONTRACTUAL TERMS
OSRV

Shell Offshore, Inc.

By: Alan T. Power

Its: Alan T. Power

Date: 5-16-06

Edison Chouest Offshore, L.L.C.

By: Roger White

Roger White

Its: Senior Vice-President, as agent

Date: 5-17-06

STATEMENT OF CONTRACTUAL TERMS
ARCTIC ENDEAVOR

CONFIDENTIAL

Vessel Request Order

(Ref: SOI/SDDI/SDPI Service Agreements)

VRO Number: 406
Date of issue: 11/17/2006

Pursuant to the terms and conditions that certain Master Agreement 4610012929 as amended, entered into by and between Shell Offshore, Inc. (SOI), and other appropriate Shell entities and Crowley Marine Services , This VRO sets forth our understanding and agreement that the captioned vessel has been chartered by Crowley Marine Services to SOI

Charter Details

Vessel Name:	Arctic Endeavor	**Starting Fuel (Gals):**	0	☑ Term Vessel	
Type:	Barge	**Est. Hourly Fuel:**	0	**Year 1 Rate:**	$2,400.00
Day Rate:	$2,400.00	**Date Time On Charter:**	5/1/2007 0:01	**Year 2 Rate:**	$2,400.00
Riggers Included:	☐	**Expected Days Of Charter:**	3 yrs	**Year 3 Rate:**	$2,400.00
		Cancellation Terms:	Non Cancelable	**Bid Ref #:**	
Shell Focal Point:	Kate Marstall	**Terminal Hired:**		**Charge Code:**	

Reason Hired:
Oil Spill Response

Special Equipment:

Special Conditions:
Port of Delivery and Re-Delivery is Seattle, Washington.

The delivery date noted in this VRO is an estimated delivery date and will be firmed up as the project/upgrade timeline is confirmed.

Any reimbursables, including outside engineering charges, will be at cost plus 10% unless such reimbursables are charged in another mutually agreeable fashion.

Owner and Charterer have agreed that in addition to the initial 3-year term, Charterer is granted (3) 3-year contract extensions at Charterers option. The pricing for each option will be based on the cumulative increase in the Consumer Price Index, All Consumers, US – All Products, from year one to year three of the agreement. Each subsequent increase will be priced using the same methodology.

The term of the VRO is 3-years firm and non-cancelable by either party unless by mutual agreement. However, in the event Charterer deems that Owner's safety program is insufficient, Charterer retains the ability to cancel the agreement.

Misc:

Vessel Specifications

DP Type:		**Seats:**	0	**Water Cap (bbls):**	0	**Fire Monitors:**	0
Overall Length (ft):	205	**Min Draft (ft):**	10	**Fuel Cap (gals):**	0		
Overall Width (ft):	90	**Max Draft (ft):**	12	**Liquid Mud Cap (bbls):**	0		
Clear Deck Length (ft):	0	**Max Speed (kts):**	0	**Dry Bulk Cap (ft3):**	0		
Clear Deck Widt (ft):	0	**Cruise Speed (kts):**	0	**Methanol Cap (bbls):**	0		

FAX SIGNED ACCEPTANCE TO ATTENTION OF SHELL SUPPLY CHAIN MANAGEMENT AT 504-728-0637

STATEMENT OF CONTRACTUAL TERMS
ARCTIC ENDEAVOR

CONFIDENTIAL **Vessel Request Order**

(Ref: SOI/SDDI/SDPI Service Agreements)

VRO Number: 406
Date of issue: 11/17/2006

Acceptance

Contractor		Shell	
Print Name:	Michael P. O'Shea	Print Name:	Alan T. Power
Signature:		Signature:	
Title:	Authorized Agent	Title:	SEM Operations Mgr
Date:	12/13/06	Date:	12-12-06

STATEMENT OF CONTRACTUAL TERMS
CROWLEY POINT BARROW TUG

CONFIDENTIAL

Vessel Request Order

(Ref: SOI/SDDI/SDPI Service Agreements)

VRO Number: 407
Date of issue: 11/17/2006

Pursuant to the terms and conditions that certain Master Agreement 4610012929 as amended, entered into by and between Shell Offshore, Inc. (SOI), and other appropriate Shell entities and Crowley Marine Services , This VRO sets forth our understanding and agreement that the captioned vessel has been chartered by Crowley Marine Services to SOI

Charter Details

Vessel Name:	Point Barrow	**Starting Fuel (Gals):**	0	☑ Term Vessel	
Type:	Tug	**Est. Hourly Fuel:**	0	**Year 1 Rate:**	$5,600.00
Day Rate:	$5,600.00	**Date Time On Charter:**	5/1/2007 0:01	**Year 2 Rate:**	
Riggers Included:	☐	**Expected Days Of Charter:**	3 yrs	**Year 3 Rate:**	
		Cancellation Terms:	Non Cancelable	**Bid Ref #:**	
Shell Focal Point:	Kate Marstall	**Terminal Hired:**		**Charge Code:**	

Reason Hired:
Alaska Oil Spill Response

Special Equipment:

Special Conditions:
Port of Delivery and Re-Delivery is Seattle, Washington.

The delivery date noted in this VRO is an estimated delivery date and will be firmed up as the project timeline is confirmed.

Year 1 rate is fixed at the rate contained in this VRO. The Year 2 and Year 3 rates of the initial term will be adjusted for changes in the Consumer Price Index, US - All Consumers upon each anniversary date. The new rate shall be the product of the existing rate and the percentage change in index values between the month of the anniversary date and the same month of the prior year. Each subsequent increase (including option years) will be priced using the same methodology

During periods when the vessel crew is demobilized the day rate for the vessel shall be $2,500 per day.

If it so chooses, Charterer may return the vessel to Seattle, WA or some other mutually agreeable location during each off-season. In such an event Owner is encouraged to seek alternate employment for the vessel. If alternate employment can be secured, Charterer will not be responsible for any portion of its contracted day rate during the period of alternate employment (unless such employment is at a lower rate than the charter rate).

Owner and Charterer have agreed that in addition to the initial 3-year term, Charterer is granted (3) 3-year contract extensions at Charterers option.

The term of the VRO is 3-years firm and non-cancelable by either party unless by mutual agreement. However, in the event Charterer deems that Owner's safety program is insufficient, Charterer retains the ability to cancel the agreement.

Misc:

Vessel Specifications

DP Type:		**Seats:**	0	**Water Cap (bbls):**	4000	**Fire Monitors:**	0
Overall Length (ft):	90	**Min Draft (ft):**	6	**Fuel Cap (gals):**	60000		
Overall Width (ft):	32	**Max Draft (ft):**	8	**Liquid Mud Cap (bbls):**	0		
Clear Deck Length (ft):	0	**Max Speed (kts):**	0	**Dry Bulk Cap (ft3):**	0		

FAX SIGNED ACCEPTANCE TO ATTENTION OF SHELL SUPPLY CHAIN MANAGEMENT AT 504-728-0637

STATEMENT OF CONTRACTUAL TERMS
CROWLEY POINT BARROW TUG

CONFIDENTIAL

Vessel Request Order

(Ref: SOI/SDDI/SDPI Service Agreements)

VRO Number: 407
Date of issue: 11/17/2006

Clear Deck Widt (ft): 0 Cruise Speed (kts): 0 Methanol Cap (bbls): 0

Acceptance

	Contractor		Shell
Print Name:	Michael P. O'Shea	Print Name:	Alan T. Power
Signature:	Michael P. O'Shea	Signature:	Alan T. Power
Title:	Authorized Agent	Title:	SCM Representative
Date:	12/13/06	Date:	12-12-06

FAX SIGNED ACCEPTANCE TO ATTENTION OF SHELL SUPPLY CHAIN MANAGEMENT AT 504-728-0637

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APPENDIX C:
FUEL TRANSFER PROCEDURES

1. ***Kulluk* Fuel Transfer Procedures**
2. ***Frontier Discoverer* Fuel Transfer Procedures**
3. **Oil Spill Response Vessel and Barge Fuel Transfer Procedures**

1. Kulluk Fuel Transfer Procedures

DIESEL/HELI-FUEL

TRANSFER MANUAL

FOR THE MODU
KULLUK

INTRODUCTION

This section of the manual is to be used as a guide for the safe transfer of diesel oil between vessels (supply ships, fuel barges, etc.) and the MODU *Kulluk* and for fuel transfers that are internal to the *Kulluk*.

All practices comply with procedures set by the Canadian Coast Guard Arctic Ship Safety and the United States Coast Guard as interpreted from various publications.

CONTENTS FOR DRILL RIG FUEL TRANSFER SECTION

1.0 FUEL OIL SYSTEM OVERVIEW

The Fuel Oil System consists of:

- Three Hull Storage Tanks (1603.3 m^3 total)
- Two Fuel Oil Transfer Pumps (6.3 litres/sec.ea.)
- Two Fuel Oil Booster Pumps (3.15 litres/sec. ea.)
- One Fuel Oil Settling Tank (14 m^3)
- One clean Oil Tank (14 m^3)
- Various Misc.Tanks (13.1 m^3 total)
- Two Fuel Oil Filters
- Two Fuel Oil Purifiers
- Associated Strainers, F.O. Meters, Piping

The three hull storage tanks (5P-10C; 5P-12C2; 5S-11C) have a total capacity of 1603.3 m^3. These tanks are located in the 5m level and are each fitted with emergency shut off valves (air operated) on both the high and low suctions, high level alarms, low level alarms, remote level indicators, and armored-type gauge glasses which are fitted to the storage tanks via self closing valves (spring close/air open). In addition each tank is also fitted with manual sounding pipes which are accessed from the 10 m level.

These tanks can be filled, via a duplex strainer located on the 10 m level, from any one of three loading stations located on the main deck (port deck, fwd. deck, starboard deck). Each station is equipped with dry break fittings (5") and a permanent drip tray.

The two fuel oil transfer pumps are used to transfer fuel from the hull storage tanks to the fuel oil setting tank or to discharge fuel oil via the loading stations to one of the support vessels. (ice breaker/supply ship). As these pumps can also be used to off load fuel each loading station is equipped with a start/stop station for remote operation of the pumps. The two transfer pumps can also be operated from a remote stop/start station near the F.O. settling tank and from local stations at the pumps themselves.

In operation the pumps draw fuel from the storage tanks through one of the two suctions and discharge it via a duplex strainer and F.O. meter to either the deck stations or the settling tank.

Fuel in the settling tank is then drawn through the fuel oil purifier where solids and water are removed and the clean fuel discharged to the clean oil tank which is also used as the diesel engine day tank. Both the settling tank and the clean oil tank are fitted with high and low suctions, emergency shut off valves (air operated), low level alarms, flat type gauge glasses, self closing sludge valves and overflow pipes which return excess F.O. to the hull tank 5P - 10C .

The fuel oil booster pumps can be used to transfer fuel from the settling tank to the clean oil tank and from the clean oil tank through two sock type filters to the fuel oil tanks of;

- boiler
- cold start compressor
- emergency generator
- incinerator
- deck cranes
- crude oil tank
- Schlumberger unit
- survival anchor windlass diesel
- and to the mud pits.

The boiler day tank, emergency generator day tank and the incinerator day tank are all fitted with overflow pipes which return excess fuel back to the hull storage tanks.

1.1 PRE TRANSFER REQUIREMENTS

Before any fuel transfer operation can take place that involves either the taking on of fuel or the discharging of fuel the following must be adhered to.

NO VESSEL TO VESSEL TRANSFERS WILL TAKE PLACE ON ANY RED ALERT STATUS

a) The appropriate local authorities must be notified of the intent to transfer fuel as soon as is practical before the transfer operation is begun. Preferably 24 hours prior to commencement.

I In Canadian Waters

Contact: Arctic Canada Traffic Systems (Nordreg) via Coast Guard Radio in Inuvik

II In American Waters

Contact:

b) If the transfer location is outside port facility areas, a warning announcement must be broadcast to vessels in the area stating the names of the vessels involved in the transfer, their geographic location and expected duration of transfer. A wide berth should be requested. Once the transfer operation has been completed the warning should be cancelled.

c) Pre-transfer checklist must be completed.

d) Emergency procedures must be reviewed.

e) There shall be a person in charge on the transferring vessel or facility and the receiving vessel or facility who will remain at the sites of the oil transfer operation and be immediately available to the oil transfer personnel. Each person must be familiar with vessel oil transfer procedures and conduct the transfer in accordance with them.

f) The person in charge of oil transfer operations on the transferring vessel or facility shall convene a conference to ensure that each person in charge understands the following details of the transfer operations:

(1) The identity of the product to be transferred;
(2) the sequence of transfer operations;
(3) the transfer rate;

(4) the name or title and location of each person participating in the transfer operations;
(5) details of the transferring and receiving systems;
(6) critical stages of the transfer operation;
(7) federal, provincial, state, and local rules that apply to the transfer of oil;
(8) emergency procedures;
(9) discharge containment procedures;
(10) discharge reporting procedures;
(11) watch or shift arrangement;
(12) transfer shut-down procedures.

g) The vessel alert status be upgraded to yellow and appropriate announcements made.

h) Both the transferring vessel/rig and the receiving vessel/rig must have a person standing by at the loading/offloading station in a position that enables them to monitor the fuelling hose at all times. Both parties must be familiar with the operation of the pump emergency stops and be able to communicate with each other via U.H.F. radio.

i) The area authority will be responsible to verify correct alignment of valves.

j) The area authority will be responsible for the posting of all personnel required for a safe fuel transfer.

k) A person must be assigned to observe the rate of loading for the purpose of avoiding an overflow of tanks. This person must also be able to communicate with the transferring location.

1.2 POST TRANSFER REQUIREMENTS

a) Complete post transfer check list.

b) File all checklists with appropriate signatures.

1.3 EMERGENCY PROCEDURES

1.3.1 Stop Transfer Immediately in the Event Of

- An environmental or well red alert.
- Lost communications.
- Sign of spillage, or damage to hoses and couplings,
- Any detection of accumulated gases.
- Major increase in wind, swell or hazardous ice movement.
- When an electrical storm is present or predicted.
- Severe deterioration in ice or visibility conditions.

1.3.2 Oil Spill Situation

a) Immediately notify Operator's Representative.

b) Initiate spill contingency plan and Emergency Notification.

b) Operator and Drilling unit owner will inform appropriate government Regulatory Agencies, of the situation as follows:

- Location and time of spill.
- Type and approximate quantity of product spilled.
- Precautions being taken at time of notice.
- Current state of tide and local weather.
- Extent of local and shipboard containment and recovery resources.
- Personnel number and skills available on site.
- Request extra resources, and advice, if needed.

EXCEPT AS PERMITTED UNDER PARAGRAPH (b) OF THIS SECTION, NO PERSON MAY RESUME AN OIL TRANSFER OPERATION AFTER IT HAS BEEN STOPPED UNLESS:

- Oil discharge in the oil transfer operation work area is cleaned up, and;
- oil discharged into the water or upon the adjoining shoreline is cleaned up,
- AND ONLY GOVERNMENT AUTHORITY MAY AUTHORIZE RESUMING THE OIL TRANSFER OPERATION IF IT IS DEEMED APPROPRIATE.

VESSEL TO VESSEL PRE-TRANSFER CHECKLIST		
TASKS	**COMMENTS**	**Area Authority**
A pre-transfer conference. Held		
A pre-transfer announcement made.		
All personnel involved aware of transfer procedures.		
Vessel alert status upgraded to yellow.		
U.H.F. radios will be required, are they fully operational and intrinsically safe?		
Is all firefighting equipment tested, fully operational and in proper location?		
All regulations for transfer are being understood and observed;		
Are flashlights to be used approved?		
Spill containment equipment and materials readily available.		
Ensure transfer emergency shutdown system is tested.		
Hoses to be used have been checked for: **a) correct diameter & length to reach other station**		
b) chafing, cracks, or other deformation,		
c) damaged fittings,		
d) Lugs on camlock fittings wired.		
e) Pressure rating satisfactory.		
f) Ensure that transfer hoses are adequately supported.		
g) Rubber seal on camlock fittings is in good condition.		
All other craft alongside are authorized and following ignition hazard warnings, etc.		
Has transferring/receiving vessel been electrically bonded to rig?		

VESSEL TO VESSEL PRE-TRANSFER CHECKLIST			
TASKS	**COMMENTS**		**Area Authority**
Ship's electrical leakage to ground is at a safe level.			
Monitor gas concentration accumulation in still air conditions.			
All doors and ports which are required to be closed are closed.			
All scupper plugs in place.			
Deck area around filling station free of debris			
Manifolds drained before removing blanks.			
Are pressure gauges operational?			
Drip trays all have plugs fitted.			
Ensure that lighting is adequate for all transfer requirements.			
Check all moorings regularly.			
All tank vents open, and flash screens in place.			
Areas authority to verify valve alignment.			
All valves not used shut and blanked on the fuelling stations not being used..			
Regularly check the water around vessels for evidence of leakage.			
Keep a continuous check on hose pressure to ensure recommended pressure is not exceeded.			
All tanks sounded manually prior to beginning of transfer.			
Personnel assigned to deck station.			
Personnel assigned to observe rate of loading.			
Officer In Charge (MATE)	Name:		
	Title:		
Officer In Charge (ENGINEER)	Name:		
	Title:		

VESSEL TO VESSEL POST TRANSFER CHECKLIST			
TASKS	**COMMENTS**		**Area Authority**
Have hoses been drained and capped prior to their return to the vessel (Rig)?			
Ensure that all vessel (Rig) valves and tanks are closed.			
Ensure that hoses and other transfer equipment are properly stowed.			
A post-transfer PA announcement.			
Vessel alert returned to appropriate status transfer recorded in oil record book.			
Officer In Charge (MATE)	Name:		
	Title:		
Officer In Charge (ENGINEER)	Name:		
	Title:		

1.6 INTERNAL FUEL TRANSFER

NO INTERNAL FUEL TRANSFERS ARE TO TAKE PLACE DURING ANY RED ALERT STATUS WITHOUT THE PRIOR APPROVAL OF THE MAINTENANCE SUPERINTENDENT.

INTERNAL FUEL TRANSFER PROCEDURE

General

NO INTERNAL FUEL TRANSFERS ARE TO TAKE PLACE DURING ANY RED ALERT CONDITIONS WITHOUT THE PRIOR APPROVAL OF THE MAINTENANCE SUPERINTENDENT.

Internal fuel transfers will be the sole responsibility of the mechanic ll on shift, exceptions to this rule must be approved by the Maintenance Superintendent.

It is the responsibility of the crane operators, watch keepers, and service hands to make their
fuel needs known to this man.

He will be the only man to open valves and operate pumps. Fueling of the well test unit, cranes,
survival windlass, lifeboats, fast rescue boat, or transfer to the mud pits will be requested by the
equipment user but carried out by this man.

This is a priority task and he will not answer telephone pages etc. during this period. While the
main transfer pump is running he will NOT leave the control switch.

If a vessel general alarm should occur he will shut down any pumps running and close any valves
in use. He will then report to his duty station. Upon reporting to his station he will communicate the internal fuel tank status to the Maintenance Superintendent.

Internal fuel transfer will take place from 10:00 to 12:00 on day shift and 22:00 to 24:00 on night shift.

Fuel will NOT be transferred at any other time, except at the direct direction of the Maintenance Superintendent.

All fuel system discharge points external to the machinery spaces will be kept locked to prevent any
accidental tampering with the valves. Keys will be in the possession of the Mechanic ll.

Fuel system valves used during transfer will all be closed once transfer is completed.

Drain plugs will be kept in fuel oil catch basins at all times, except during cleaning.

The INTERNAL FUEL TRANSFER check list will be filled out during and signed after each transfer. This checklist will provide the daily fuel usage figures for the daily log sheets. Each action on the checklist will be initialled by the mechanic ll.

KULLUK INTERNAL F.O. TRANSFER CHECK LIST

VALVE STATUS DATE_____ TIME_____

	VALVE	OPEN	CLOSED
5S-11C	4HV-1 upper suction		
	4HV-2 lower suction		
5P-10C	4HV-3 upper suction		
	4HV-4 lower suction		
5P-12C	4HV-5 upper suction		
	4HV-6 lower suction		
PUMP MANIFOLD	4-HV7		
	4HV-9		
	4HV-8		
TRANSFER PUMP	4HV-10 suction #1		
	4HV-22 discharge #1		
	4HV-11 suction #2		
	4HV-24 discharge #2		
FLOW METER	4HV-26 to settling tank		
	4HV-28 to deck fill		
	4HV-27 inlet		
	4HV-30 outlet		
SETTLING TANK	4HV-31 inlet		
	2HV-4 upper suction		
	2HV-2 lower suction		
	4HV-5 upper inlet bypass		
	2HV-32 sump drain		
CLEAN OIL TANK	2HV-13 lower suction		
	2HV-15 upper suction		
	2HV-33 sump drain		
	2HV-7 transfer pump suction		
PUMP #1	2HV-9 suction		
	2HV-62 discharge		
PUMP#2	2HV-10 suction		
	2HV-64 discharge		
HAND PUMP	2HV-11 suction		
	2HV-65 discharge		
Common bypass	2HV-60		
FILTER #1	2HV-67 inlet		
	2HV-18 outlet		
	2HV-83 sump		
FILTER #2	2HV-67 inlet		
	2HV-70 outlet		
	2HV-88 sump		
Common Discharge	2HV-55		
CENTRIFUGE #1	5HV-2 inlet		
	5HV-11 outlet		
	5HV-5 heater inlet		
	5HV-6 heater outlet		
CENTRIFUGE #2	5HV-1 inlet		
	5HV-13 outlet		
	5HV-7 heater inlet		

5HV-8 heater outlet

	VALVE	OPEN	CLOSED
MAIN ENGINES	2HV-17 supply #1		
	2HV-18 supply #2		
	2HV-19 supply #3		
	2HV-21 return #1		
	2HV-23 return #2		
	2HV-25 return #3		
BOILER TANK	2HV-74 fill		
	2HV-44 high suction		
	2HV-42 low suction		
	2HV-34 sump		
DIESEL COMP.	2HV-75 supply		
WATER HEATERS	2HV-47 inlet #1		
	2HV-48 inlet #2		
BOILERS	2HV-132 supply #1		
	2HV-131 supply #2		
STEAM GENERATOR	2HV-130 supply		
	2HV-101 return		
INCINERATOR	2H-127 inlet		
	2HV-29 suction		
EMERGENCY GEN.	2H-119 inlet		
	2HV-26 suction		
	2HV-28 return		
DECK SIDE EQUIP.	2HV-77 crane #1		
	2HV-76 crane #2		
	2HV-129 crane #3		
	2HV-122 testing unit		
	2H-132 mud pits		
	2HV-80 well logging unit		
	2HV-82 windlass		
LOADING STAT.	4HV-32 fwd.		
	4HV-33 stb.		
	4HV-35 p.		

TANK LEVEL	START	FINISH
5S-11C		
5P-10C		
5P-12C		

FLOW METER READING
4HV-26 to settling tank
4HV-28 to deck fill main

FUEL TRANSFER SYSTEM STATUS

_____

TOTAL FUEL TRANSFERRED _____

TRANSFER CARRIED OUT BY _____
(signature)

NOTE:
INITIAL STATUS OF EACH VALVE
REFER TO AS BUILD DRAWING MB#3 FOR SYSTEM SCHEMATIC
SCHEMATICS ARE POSTED BY PUMP CONTROLS

FUEL TRANSFER PROCEDURE

Contact control room to check that the vessel is not on RED alert status.

Confirm that all fuel supply valves external to the machinery spaces are closed and LOCKED
closed.

COMPLETE THE INTERNAL FUEL TRANSFER CHECK LIST AS THIS PROCEDURE IS CARRIED OUT.

NOTE; IF THERE IS A LEAKING OR OPEN DISCHARGE VALVE, IT WILL SPILL FUEL AT ANY TIME THAT THE PUMP IS RUNNING. ALL SERVICES DOWNSTREAM OF THE CLEAN OIL TANK ARE FED FROM A COMMON HEADER.

To supply fuel to operating equipment day tanks:

Open appropriate valves for the desired fuel pump and filter,and pump fuel from clean oil tank through fuel filters to required day tanks. Do not carry out any other operation while this pump is operating.

If the cranes, etc. require fuel, the mechanic ll will fuel them and lock the valve closed when complete.

NOTE: all valves should be closed, except those required for the normal operation of machinery.

To supply fuel to the settling tank from the main fuel tanks on +5 level:

Note tank Levels and flowmeter reading before start.

Open the appropriate valves to draw fuel from the tank desired, line up the desired pump,
and flow meter. All other valves should be closed.

Return to the engine room and operate the pump from the remote switch by the day tanks. Do not leave until this operation is complete

Once complete and the pump is stopped, return to the +5 pump room and record the fuel tank levels
and the flow meter reading.

NOTE: close all valves.

While out this procedure, inspect fuel system for any sign of leaks. Fill out status blank on checklist.

Sign completed form and note fuel consumption on daily mechanical log. Return completed
checklist to Maintenance Superintendent at end of shift.

1.7 DIESEL OIL SYSTEM

1.7.1 Product Specifications and Material Safety Data Sheets

DIESEL O

PRODUCT CHARACTERISTIC	*SPECIFICATION*		*TEST METHOD*
	MIN	*MAX*	*ASTM*
Pour Point, °C (°F)		-15 (5)	D 97
Cloud Point, °C (°F)		-10 (14)	D2500
Density, kg/L @ 15°C		0.900	D1298
(API Gravity at 60° F)		(25.6)	
Distillation, °C (° F)			D 86
10% Recovered		238 (460)	
90% Recovered		360 (680)	
End Point		371 (699)	
Flash Point, °C (°F)	52 (126)	80 (196)	D 93
Kinematic Viscosity, cSt @ 40°C (SSV at 100 ° F)	1.4 (30)	4.1 (39.5)	D 445
Sulpher, % mass		0.5	D2622
Mercaptan Sulfer, % mass		.005	D3227
Corrosion Copper Strip at 3 h @ 100° C (3h at 210° F)		No. 1	D 130
Water and Sediment, % vol		0.05	D1796
Ash, % mass		0.01	D 482
Carbon Residue (RCR), on 10% bottoms, % mass		0.20	D 524
Total Acid Number, mg KOH/g (% mass KOH)		0.10 (0.01)	D 974
Strong Acid Number, mg KOH/g (% mass KOH)		<0.05 (<0.005)	D 974
Strong Base Number, mg KOH/g (% mass KOH)		<0.05 (<0.005)	D 974
Cetane Number	40		D 613
Electrical Conductivity, pS/m @ 25°C			D2624
Feb. 1 - Jul. 31	135		
Aug. 1 - Jan. 31	200		
Appearance	Bright & Clear		D4176
Colour		3.0	D1500
Stability, Insoluble, mg/100 mL (oz/gal)		2.0 (2.67×10^{-5})	D2274

TRADE NAMES:	Type & Diesel Fuel	SUPERCEDES:
CGSB REFERENCES:	CAN2-3.6-M83 Type B	PLC: M-061

MATERIAL SAFETY DATA SHEET

WHMIS CLASSIFICATION

Combustible Liquid (Class B3)
Poisonous Material (Class D2)

PRODUCT CODE

DATE: April 11, 1990

SECTION I MATERIAL IDENTIFICATION

Trade Name:	DIESEL FUEL
Other Names:	Diesel 20X, 0, 15, 20, 25, 30, 40, 40S, 50, 60 Diesel AA, Diesel GM 35, 45 Domestic Marine Diesel, Power Plus Diesel
Chemical Synonyms and Family:	Petroleum Hydrocarbon
Names of Manufacturer/Supplier Address & Emergency Phone Number:	Petro-Canada Inc. (403) 296-3000 P.O. Box 2844, Petro-Canada Centre Calgary, Alberta T2P 3E3
Poison Control Centre Numbers:	Consult local telephone directory for emergency numbers.
Application:	Diesel Fuels are distillate fuels suitable for use in high and medium speed internal combustion engines of the compression ignition type.

SECTION II TRANSPORTATION

UN Number: 1202 Primary Classification: 3.3 Subsidiary Classification: 9.2

Compatibility Groups: N/A CANUTEC Transport Emergency No. (613) 996-6666

SECTION III COMPOSITION

COMPONENTS	ALLOWABLE LIMITS (8 HR)	% (VOL)	CAS #
Complex mixture of petroleum hydrocarbons (C_9-C_{13})	5 mg/m^3 (oil mist) ** (3.12 x 10^{-4} lb/1000 ft^3)	>99.9	68334-30-5
Anti-static additive, cetane improver, pour point depressant.	N/A	<0.1	N/A

° Aromatic content is 38% maximum (Benzene nil)
°° Petro-Canada recommendation.

NR-Not Regulated N/A- Not Applicable U-Unknown

Cette fiche est aussi disponible en francais.

Trade Name: DIESEL FUEL

SECTION IV PHYSICAL DATA

DENSITY: (0 15°C)(60° F)	0.78-0.90 kg/L 56 - 25 API	Boiling Point/Range: (@ 1 atm)(14.7 psi)	145-371°C (approx) (293 - 700 °F)
Vapor Pressure: (approx) (O 25°C)(77 °F)	1 kPa (approx) (0.145 psi)	Percent Volatile: (@ 20°C)(68°F)	25% in 10 Hr.
Vapor Density: (O 20°C)(68°F)	4.5 (approx)	Evaporation Rate:	N/A
Solubility in Water:	Insoluble		
Viscosity (Kinematic): (O 40°C)(100 °F)	1.2-4.1 cSt (29 - 40 SSO)		
Pour Point:	-45 to 6°C (-50 to 20° F)	Appearance & Odor:	Clear to yellow, bright oily liquid with hydrocarbon odor.°°

°° May be dyed purple or red for taxation purposes.

SECTION V FIRE & EXPLOSION DATA

Flash Point (method used - COC):	40°C (minimum)
Flammable limits in air (% by volume):	Lower 0.7% Upper 6.0%
Auto-Ignition Temperature:	>225°C (437°F)
Fire and Explosion Hazards: MODERATE FIRE HAZARD	Treat as combustible liquid.
Extinguishing Media:	Foam, dry chemical, carbon dioxide for small fires, water spray. Do not cut, drill or weld empty containers.
Fire Fighting Procedures:	Use full protective equipment and self-contained breathing apparatus. Cover with extinguishing agent. Use water spray to cool fire-exposed containers and as a protective screen. Do not point solid water stream directly into burning product to avoid spread fire.

Trade Name: DIESEL FUEL

SECTION VI HEALTH HAZARD INFORMATION

Toxicity Data

° Estimated acute LD_{50} - 7650 mg/kg (rat, oral); practically non-toxic. Rabbit primary dermal irritation index (Draize) - 6.8 extremely irritating.
Rabbit eye irritation index (Draize) - O: non irritating

Effects of Overexposure

Inhalation: Inhalation of vapors or mist will cause headaches, nausea, dizziness, and intoxication: severe central nervous system depressant.

Skin and Eyes: Irritation, defatting and drying of skin. Prolonged exposure to skin may cause chapping, cracking or possibly dermatitis. Eye contact may cause irritation, but not permanent damage.

Ingestion:

Emergency and First Aid Procedures Information

Skin: Remove contaminated clothing - launder before reuse. Soap and water wash.
Discard saturated leather articles.

Eyes: Copious warm water flush - 15 minutes. Physician assessment mandatory.

Inhalation: Evacuate to fresh air. Apply Cardio Pulmonary Resuscitation if required. Administer oxygen if available. If resuscitation is required, physician assessment is mandatory.

Ingestion: DO NOT INDUCE VOMITING. If vomiting - take care to prevent aspiration. Give 250 ml (1/2 pint) of milk to drink. Mandatory physician assessment.

Notes to Physician: Gastric lavage should only be done after endotracheal intubation in view of the risk of aspiration which can cause serious chemical pneumonitis for which antibiotic and corticosteroid therapy may be indicated.

° Based on API Study #79-6 on Diesel Fuel where LD_{50} = 9.0 ml/kg.

Trade Name: DIESEL FUEL

SECTION VII REACTIVITY DATA

Stability:	Stable under normal storage and use.
Conditions to avoid:	Excessive heat, sources of ignition, formation of oil mist.
Materials to avoid:	Strong oxidizing agents (strong acids, peroxides, chlorine, etc).
Hazardous Decomposition products:	COx, SOx, smoke on combustion.
Can hazardous polymerization occur?:	No.

SECTION VIII SPILL OR LEAK PROCEDURES

Steps to be taken if material is released or spilled:	Avoid contact. Use full protective equipment and breathing apparatus if required. ELIMINATE IGNITION SOURCES. Contain spill. Absorb with inert absorbent such as dry clay, sand or diatomaceous earth, commercial sorbents, or recover using electrically grounded explosion-proof pumps. Place absorbent in closed metal containers. DO NOT FLUSH TO SEWER.
Waste Disposal Method:	Incinerate at licensed waste reclaimer facility.

SECTION IX SPECIAL PROTECTION INFORMATION

Ventilation:	General ventilation. Use explosion-proof mechanical ventilation suitable for group D atmospheres.
Respiratory Protection:	Up to 5 mg/m^3 (3.12×10^{-4} $lb/1000\ ft^3$)(oil mist - none required). From 5 to 50 mg/m^3(3.12×10^{-4} to 3.12×10^{-3} $lb/1000\ ft^3$) use an approved organic vapor respirator suitable for oil mist in areas with sufficient oxygen. Above 50 mg/m^3, use full-face air-supplied or self-contained breathing apparatus.
Protective Gloves:	For direct contact with hydrocarbons of more than 2 hours, VITON or NITRILE recommended. Otherwise, PVC gloves may be worn.
Eye Protection:	Chemical goggles if splashing likely.
Other Protective Clothing:	Long sleeved clothing to minimize skin contact.

N/A - Not Applicable U-Unknown

Trade Name: DIESEL FUEL

SECTION X SPECIAL PRECAUTIONS

Store in cool, well-ventilated area. Electrically ground/bond during pumping or transfer to avoid static accumulation. AVOID SKIN CONTACT AND INHALATION. Practice good personal hygiene. DO NOT SIPHON BY MOUTH OR USE AS A CLEANING SOLVENT. Launder work clothes frequently. Petro-Canada recommends an allowable exposure of 5 mg/m^3 (oil mist) when handling DIESEL FUELS.

SECTION XI REFERENCES

ACGIH, Threshold Limit Values and Biological Exposure Indices for 1989-90.

CONCAWE, First Aid Measures, Medical Toxicology Data and Professional Advice to Clinicians on Petroleum Products, February 1983.

API, Petroleum Process Stream Terms included in the Chemical Substances Inventory Under the Toxic Substances Control Act (TSCA). 1983

Environment Canada Manual for Spills of Hazardous Materials, March 1984.

Patty's Industrial Hygiene and Toxicology, 3rd Edition, Vol. 2B, 1981.

NIOSH, The Industrial Environment - Its Evaluation and Control, 1973.

API, Acute Toxicity Tests on Diesel Fuel, API # 79-6, 1980.

API, The Toxicology of Petroleum Hydrocarbons, May, 1982.

INDEX

II. HELI-FUEL SYSTEM

2.1 HELI-FUEL SYSTEM DESCRIPTION

This system provides storage, filtering and transfer of fuel from the fuel pods located on the starboard side aft of the main deck, through the pumps and filters to the delivery skid on the heli-deck.

The two fuel pods are connected to the transfer piping via quick disconnect couplings, with a dry break valve, expansion loop and emergency shut down valve. The emergency shut down valve is operated pneumatically from the control room (central control panel), or manually locally.

The pumps are controlled from a panel in the pump room and activated as required from the fuel metering skid on the heli-deck.

The fuel skid includes a go-no-go filter, a meter, electric rewind hose reel, a nozzle, and a ground cable all encased in a fibre glass box.

See figure 1.

Heli-Fuel Equipment

Centrifugal Pumps

Manufacturer: Roto-King
Quantity: 2
Model No: PUM 00196
Serial No: 1907791, 1907792
Type: AL93
RPM: 1150
Capacity: 0.23 m^3/min (60 gal) (230 liters)
Disch Press: 690 kPa (100 psi) 69 m (210 ft) head

Electric Motors

Manufacturer: Etotech Electric Motor
Quantity: 2
Model No: 6727035 Explosion Proof X yes __ no
Horse Power: 7.5 @ 1150 RPM
Volts: 230/460 v
Amps: 20 amps/10 amps
Cycles: 60
Phase: 3
Frame: 254T
Serial No: SA-006A/B

Filter Separator

Manufacturer: "3L" Filters Ltd.
Quantity: 2
Model: WAV-2028
Serial: 7352-1
Dif Change
Press: 15 PSIG
Op Press: 150 PSIG (max)
Op Temp: 100° F (max)
Hydro Test
Press: 225 PSIG
Capacity: 200 GPM (max)

Filter Coalescer

Manufacturer: "3L" Filters Ltd.
Quantity: 2
Capacity: 3.8 l/S
Disc. Press: 1034 kPa @ 1.8° C
OP Press: 345 kPa @ 1.8° C
0.57 m OD x 1.42 S/FLG

Helicopter Fuel Metering Skid

Filter Separator
Manufacturer: 3-L Filters Ltd, Cambridge Ontario
Model: 3L-75-5
Serial: 7358-1
Op Press: 152 psi

Meter

Manufacturer: Meter Liq Control Corp.
Serial: 112821
Rate: 225 LPM
Model: M5-44200-2

Hose Reel

Manufacturer: MSL Vancouver B.C. (McIntosh)
Model: EAC 1.5-100
Serial: L2-1
Size: 11" dia. Drum
Drive Motor: 1/2 HP Imperial Electric Motor

Hose

Manufacturer: Hewitt (Arctic)
Length: 100'
Dia: 1 1/2"

Ground Reel (Static)

Manufacturer: McIntosh Supply
Type: Spring Rewind
Model: SD2A2-100

Fuelling Nozzles

Quantity: 1
Manufacturer: Dover
Model: 235
Type: Gas pump type 1-½" straight nozzle

Quantity: 1
Manufacturer: JC Carter Co.
Parts #: 60427
Serial #: 23245
Type: Dry break type (Buckeye) 2-½" nozzle

Fibre Glass Cabinet

Manufacturer: McIntosh Supply
Size: 84" X 54" X 39"
Weight: 200 lbs

Heli Fuel Pods

Manufacturer: Specific Equipment Company (Houston, Texas)
Capacity: 2.2 m^3 each
Weight: Empty: 2.53 mt (5,566 lbs)
Weight: Full: 4.70 mt (10,315 lbs)

2.2 HELI-DECK SAFETY EQUIPMENT

Helicopter Firefighting Crash Kit (Outside Reception Room)

1 Jaws of Life
1 Bolt Cutters 24"
3 Seat Belt Cutters
1 Hatchet
2 Burn Blankets

Helicopter Firefighting Equipment (Reception Room)

3 Full Length Fire Coats
3 Pairs of Steel Toed Rubber Boots
3 Firefighting Helmets with Shields
1 Fire Approach Suit (Fyrepel Approach Suit)

Fire Locker #3 (3rd Deck By SCR Entrance)

2 Fire Helmets
2 Full Length Coats
4 Pair Fire Gloves
3 Pairs of Boots (Steel Shank/Toes)
2 Fire Approach Suits
1 Tool Kit
3 Rechargeable Lanterns
3 Safety Lines
2 Fire Axes

2.3 FIXED DRY CHEMICAL SYSTEM (HELIDECK SERVICE)

- 1 x 907 kg (2000 lb) unit
- Purple K Chemical
- Nitrogen Actuator Locations: Helideck port and stbd access ways
- The system can also be activated at the dry chemical tank location by manually operating the nitrogen release valves.
- Hose Locations: Port and Stbd access way locations
  Nozzle Discharge Rate: Flow 3.4 kg/sec (7.5 lb/sec)
  Range 18.2 m - 21.3 m (60/70 ft) nominal

To Operate Hose Reel

- Check that nozzle discharge valve is closed.
- Pull pin on valve of nitrogen cylinder.
- Open valve by rotating lever fully.
- Unwind hose from reel.
- Push nozzle valve handle fully forward to discharge powder.

CAUTION: DO NOT LET GO OF NOZZLE DURING POWDER FLOW.

If Hose Reel Does Not Operate

- After approximately 20 seconds close nozzle discharge valve
- Go to the main unit and operate opening appropriate valves manually.

System Description

The fixed dry powder extinguisher system provides areas of high fire susceptibility with ready access to volumes of dry powder for fighting fires which can not be handled using the portable extinguishers.

The 907 kg (2,000 lb) unit is located in the Heli Foam room (3rd deck of the engine house). This skid unit supplies two hose reels which are located on the landings of the port and starboard helideck access stairways. Dry powder used with the helideck foam system is a very effective method of fighting aircraft fires, especially when jet fuel is involved.

Operating Policies and Procedures

Authority to activate these systems must come from the OIM or his designate.

Activation of the helideck system is at the discretion of the HLO during helicopter operations as the OIM designate.

Each unit is activated by opening the manual operating lever located on the skid or by opening the remote charging valve assembly located next to each hose reel. In either case, opening the valve causes the skid mounted nitrogen cylinders to charge the system. Actual discharge of the dry powder is controlled from the hose reel discharge nozzle.

Note: *BEFORE REMOVAL OF ANY OF THE NITROGEN BOTTLES, ALL PRESSURE MUST BE BLED OUT OF ENTIRE SYSTEM. ONCE REMOVED THEY MUST BE SENT ASHORE AS SOON AS POSSIBLE FOR RECHARGING.*

2.4 FOAM FIRE EXTINGUISHING SYSTEM

System Equipment

- One 757 l (200 gal) capacity foam unit - bladder type (Feecon horizontal SNP tank).
- Two Foam Monitors - 1,893 l/min (500 gal/min) flow capacity maximum (nat. foam PC 50).
- Three Foam Dispensing Hose Reels - 30.5 m (100 ft) x 38 mm (1-1/2") hose (Servall, Goodyear).
  38 mm (1-1/2") nozzle (Rockwood) 373 l/min (100 gpm) flow capacity.
- Associated piping.

System Description

The foam system is provided to quickly suppress helicopter and fuel related fires on the helideck and helifuel storage area.

The foam system consists of a skid having a 757 l (200 gal) tank for the concentrated foaming solution, two foam proportioners (one each for the monitors and hose reels), and associated piping. The fire water pumps supply salt water to the skid where the water is control mixed with the foaming solution. The system is capable of discharging a maximum of 2,840 l/min (750 gal/min) of foam.

The skid is located in the heat foam room on the 3rd deck of the engine house. It is accessible only from an exterior walk way.

The two foam monitors are located on the forward portion of the helideck, one each on the port and starboard sides. A foam dispensing hose reel is located on the landing of each of the rear access stairways from the third deck of the quarters. The third being on the main deck forward of the heli-pad storage area.

The system is manually activated by one of the control boxes located next to each monitor and hose reel. Activation of the system automatically causes alarms on the central fire/gas control panel located in the control room.

Operating Policies and Procedures

At each hose reel and the two monitors there are small red boxes. Inside are two buttons labeled WATER and FOAM. Push WATER first, wait until water is flowing from the nozzle under pressure then activate foam by pushing foam button. System will not work in reverse order. Ensure that the fire line/foam valve is opened at each monitor and nozzle in use (located at each station).

Authority to activate the foam system is the HLOs during helicopter operations.

2.5 RECEIVING JET-B FUEL ON BOARD

From Vessel or Helicopter

From either systems of transportation the fuel will be contained in a heli-fuel pod.

If the fuel is received in a red heli-pod that is identical to the 2 heli-pods that are incorporated in the fueling system changing pods is a simple procedure.

a) Empty Tank

- Pull the pod retaining pins (4) located at the pod base.
- Shut butterfly valve on pod.
- Secure the vent cap shut on the top of the tank.
- Basket a ½" x 20 ft wire rope sling through the framework of the pod at each end. Secure a tag line to pod tank base.
- Have the Crane Operator in crane III plumb his lifting hook over the heli-pod.
- Hook on the 4 eyes of the slings.
- As the Crane Operator takes the weight of the pod, lift up on the quick release sleeve of the fuelling line coupling.
- Lift pod clear of the fuelling station and place on the stbd main deck.

b) Full Tank

- Basket pod with a ½" x 20 ft wire rope sling through the framework of the pod at each end. Secure a tag line to framework.
- Lift pod and plumb over fuelling station pod rack.
- Lower pod into position while one person is guiding in the quick release fitting into position.
- Ensure that the quick release sleeve is spring shut.
- Secure pod into rack with the 4 retaining pins.
- Disconnect slings and remove from pod.

Note: Before handling heli-fuel pods:

- Ensure that there are no helicopters inbound/outbound.
- Stop all hot work on heli-deck, after deck and stbd deck.
- Verify that the foam fire fighting system is operative.
- Have the 150 lb dry chemical wheeled extinguisher in a position adjacent to the heli-pod racks.
- Stop all spark inducing work in the work area.

2.6 PUMP ROOM ALIGNMENT (FUELLING)

- Only one pod, motor, pump, and coalescing filter to be aligned at one time.
- Open the appropriate 4 valves in the pump room.
- Open the service 2 valves located at pods racks exterior to the pump room.
- Align the control panel in the pump room set up for automatic.
- Have an experienced personnel stand by with a UHF radio at the fuel metering skid on the heli-deck.
- Have that person depress the pump actuator and confirm with pump room personnel by radio for pump start up in the pump room.
- Conduct a fuel nozzle test on heli-deck. Use the 2 gallon HLOs bucket provided in the fuel metering cabinet.
- If successful, save the fuel in the bucket for a fuel test.
- Reset litre meter by revolving handle clockwise until all digits indicate zero.
- Shut down pump from cabinet.
- Test for shutdown in pump room
- Tag and date the valves indicating the pod in use. Initial it.
- Enter in the barge log the particulars of the alignment.

2.7 FUEL TESTING

There are two types of fuel testing conducted on board the *Kulluk*.

a) Dynamic Millipore Test

Taken when the fuel line is under pressure at the downstream and upstream locations, (pump room and heli locations respectively). A dynamic millipore probe is inserted in the fuel on each of the two pump lines and one is located on the pipeline in the cabinet on the heli-deck.

These tests evaluate the contamination level of the product from the heli-pods to the nozzle.

If these tests reveal any failure of the pods, filters and pipeline efficiency, helicopters shall be suspended until the cause is rectified.

The dynamic millipore test is conducted bi-monthly and upon the reception of a new shipment of fuel.

Enter the dynamic millipore test results in the fuel log located in the reception room.

b) ASTM Color Standards Test

This test is conducted to determine contamination of the fuel by water.

To conduct this test discharge 4 liters of jet-B fuel into the white enamel pail located on the heli-deck in the cabinet.

Withdraw enough of a sample for a vial sample.

Insert the vial puncture implement into fuel, next, plunge the vial onto the puncture implement, this will induce fuel under pressure into the vile. When full, extract the vial and shake vigorously. This will mix the water seeking chemical with the Jet-B fuel. A white color indicates the fuel is free of water, a pink to reddish color indicates the fuel is contaminated. If contaminated suspend any helicopter fuelling until problem is rectified.

This test shall be conducted prior to fuelling a helicopter and immediately after fuelling. This test shall be conducted by the HLO (Helicopter Landing Officer) and witnessed by the Helicopter Pilot.

These samples shall be dated and marked with call sign of Helicopter and retained by the HLO for at least 1 week's duration.

Enter these test results in the Helicopter fuelling procedure checklist, and fuelling log book (located in the reception room) and the amount of fuel the helicopter received. These entries must be dated and initialed by the observing Helicopter Pilot.

2.8 HELI-FUEL SYSTEM PREVENTATIVE MAINTENANCE

Besides the fuel tests the fuelling system shall be inspected from the heli-pods to the nozzle.

Heli-Fuel Racks

- Quick release coupling valve, leakage and visual condition.
- Inspect for placement/condition of sounding pipe cap, and ventilation cap.
- All valves, operable and lubricated.
- Pneumatic shutdown valve (automated from the control room) activate from control room and have person witness the closure of said valve. Reset upon successful closure.
- Inspect drip tray under heli-pods for cleanliness, dryness, and test drip tray valves for operable condition.

Heli-Fuel Pump Room

- All valves, operable and lubricated.
- Pump alignment switch panel, test each pump/motor system for start and shutdown.
- Check illumination of Heli pump/motor indicator lights.
- Inspect pump room for cleanliness and dryness.

Heli-Deck Fuel Skid

- Inspect Fibreglass HLOs cabinet for damage to shell and insure that cabinet doors are operable.
- Inspect all valves, operable and lubricated.
- Inspect fuel meter, glass face condition, reset handle.
- Inspect system for leakage.
- Ground static reel/wire for operable condition.
- Inspect nozzles for visual condition, ensure that a brass cap is connected to the straight nozzle. Test dry break nozzle for handle activated opening and closure.
- Run out hose inspect for wear and damage.
- Inspect hose reel for revolution and lubrication.
- Inspect drip tray for cleanliness and dryness.
- Ensure that drip tray plugs are conveniently secured beside each scupper.
- Ensure that a white enamel bucket (only) is in place in the cabinet.

2.9 FUELLING PROCEDURE
(Crew Requirement; 1 HLO, 3 Heli-Deck Crew)

Fuelling Crew Positions

HLO (Helicopter Landing Officer) is in charge of fuelling.

1 Crewman dressed in full fire approach suit stationed at the up wind with foam/drychemical hoses at either the port or stbd heli-deck stairwell.

1 Crewman stationed at the upwind foam/water fire monitor.

1 Crewman assists the HLO at the fuel meter cabinet. He will have at hand a 150 lb dry chemical extinguisher, the hose is flaked out on deck prior to the commencement of testing and fuelling.

The Helicopter Pilot is positioned at the helicopter overseeing the operation.

Procedure

This procedure can only be implemented after the above safety positions are assumed.

- Run out and ground the static wire to the helicopter.
- HLO takes a sample (minimum 4 liters) of Jet-B from the fuel sampling valve in the fuelling cabinet. (See fuel testing section).
- On acceptance of fuel sample by HLO and Pilot run out fuel hose to fill location on helicopter.
- Return fuel meter to zero.
- HLO commences fuelling helicopter while crewman is standing by the fuel cabinet.
- Fill to Helicopter Pilots request in liters indicated on meter in cabinet.
- On reaching the fill amount, remove nozzle and re-spool the fuel hose by activating hose reel spooling motor.
- Take another fuel sample.
- Shutdown pumps.
- Have the pilot initial the Helicopter Fuelling Log and Helicopter procedure checklist. This checklist shall also have date, fuel amount, and helicopter call sign.
- Date, initial, and enter call sign on the two fuel samples, place the samples in the fuel test box for storage.
- Re-spool static ground wire.
- Zero fuel meter.
- Close up cabinet.
- Put the 150 dry chemical extinguisher in its cabinet.

HELICOPTER FUELLING PROCEDURE CHECKLIST		
Type of Fuelling Operation (Hot/Normal)		
Name of Vessel/Rig (Donor)		
Helicopter Call Sign (Recipient)		
Date of Fuelling Operation		
Time of Fuelling Operation		
Location (Rig Site)		
No. of Crewman on Standby Crew		
Inform Control Room		
Expected Type & Quantity of Fuel		
Actual Amount of Fuel (Meter Reading)		
Ground Static Wire To Helicopter		
Take Fuel Sample (First)		
Approval of Sample By Pilot & HLO		
Return Fuel Meter To Zero		
Commence Fuelling as Indicated by Pilot		
Stop Fuelling as Indicated By Pilot		
Remove Nozzle and Re-spool Hose		
Take Fuel Sample (Second)		
Shut-down Pumps		
Have Pilot Sign Checklist & Fuelling Log		
Date, Initial & Call Sign on Two Fuel Samples		
Place Samples in Box For Storage		
Re-spool static ground wire		
Zero Fuel Meter		
Close Up Fuelling Cabinet		
Put the 150 lb Dry Chemical Extinguisher in its Cabinet		
Stand-Down From Fuelling Operation		
Rig Alert Status		
Donor Officer In Charge (HLO)	Name	
	Title	
Recipient Officer In Charge (Pilot)	Name	
	Title	

JET B

PRODUCT CHARACTERISTIC	*SPECIFICATION*		*TEST METHOD*
	MIN	*MAX*	*ASTM*
Freezing Point, °C (° F)		-51 (-60)	D2386
Density, kg/L @ 15°C (API at 60 °F)	0.750 (57.0)	0.801 (45.1)	D1298
Distillation, °C			D 86
Initial Boiling Point, °C (°F)	Report	Report	
10% Recovered, °C (°F)	Report	Report	
20% Recovered,°C (°F)		143 (289)	
50% Recovered, °C (°F)		188 (370)	
90% Recovered		243 (469)	
End Point, °C (°F)	Report	Report	
% Recovered, at 204° C (400° F)		1.5	
Residue, % vol		1.5	
RVP, kPa (psi)	1 (203)	21 (3.05)	D 323
Sulphur, % mass		0.4	D1266/D2622
Mercaptan Sulfur, % mass		0.003	D3227
or Doctor Test		Negative	D 484
Corrosion Copper Strip (2 h @ 100° C/212 °F)		No. 1	D 130
Corrosion Silver Strip (Note 1)		No. 1	IP227/PCP300
Copper, mg/L (Note 2)/(oz/gal)		0.15 (2 x 10^{-5})	3-GP-0 131.1
Aromatics, % vol		25.0	D1319
Olefins, % vol		25.0	D1319
Net Heat of Combustion, MJ/kg (BTU/lb)	42.8 (18,400)	<0.05	D1405/D2382
Combustion Properties: one of the following:			
1. Luminometer No.	45		D1740
2. Smoke Point, mm (inch)	25 (1.00)		D1322
3. Smoke Point, mm (inch)	20 (0.80)		D1322
Plus Naphthalenes, % vol		3	D1840
Electrical Conductivity, pS/m @ point, time and temp. of delivery to purchaser	50	500	D2624
Water Separation Index (Modified)	75		D2550/D3602/
Separation Rating		2	
Interface Rating		lb	D2274
Total Acidity, mg KOH/g (% mass KOH)		0.1 (0.01)	D 974
Particulate Matter, mg/L (oz/gal)			D2276
Purchaser's bulk storage (Note 4)		2.2 (2.94 x 10^{-}	
Aircraft and refuellers		0.44 (5.87 x	
Appearance		bright & clear	

PRODUCT SPECIFICATION

JET B

PRODUCT CHARACTERISTIC	*SPECIFICATION*		*TEST METHOD*
	MIN	*MAX*	*ASTM*
THERMAL STABILITY:			
JFTOT PROCEDURE			D3241
Press. drop, kPa (psi)		3.4 (0.49)	
Heater deposit rating		<3	
- max. hater tube temp. 260° (500 °F)			
- fuel system pressure 3.45 MPa (500 psi)			
- fuel flow rate 3 mL/min. (7.93×10^{-4} gal/min)			
- test time 150 min.			
COLOUR, Saybolt	Report	Report	D 156

NOTES:

1. Purchaser option.
2. Copper content requirement waived for fuels not subject to copper sweetening process.
3. Smoke Volatility Index (SVI)
   SVI = Smoke Point (mm) + 0.42 (% vol recovered @ 204° C /
4. A minimum of 4L shall be filtered.

TRADENAMES: Turbine Fuel-Aviation Wide Cut SUPERSEDES:
CGSB REFERENCES: CAN2-3.22-M80 Jet B PLC: M-059

MATERIAL SAFETY DATA SHEET

WHMIS CLASSIFICATION

Flammable Liquid (Class B2)
Poisonous Material (Class D2)

CHEMICAL CODE: 3701, 3703, 3706
3444-02

DATE: August 1, 1988

SECTION 1 MATERIAL IDENTIFICATION

Product Name:	Aviation Turbine Gasoline (ATG)
Trade Names:	Jet B, Jet B D-1
Chemical Synonyms and Family:	International Jet B, International Jet B D-1, Jet Fuel JP-4, Jet Fuel F-40
Name of Manufacturer/Supplier Address & Emergency Phone Number:	Petro-Canada Inc. (403) 296-3000 P.O. Box 2844, Petro-Canada Centre Calgary, Alberta T2P 3E3
Poison Control Centre Numbers:	Consult local telephone directory for emergency numbers.
Application:	Used as aviation turbine fuel. May contain a fuel system icing inhibitor.

SECTION II TRANSPORTATION (NR - Not Regulated by TDG)

UN Number 1863 Primary Classification: 3.1 Subsidiary Classification: N/A

Compatibility Groups: N/A CANUTEC Transport Emergency No.: (613) 996-6666

FLAMMABLE LIQUID

Material Trade Name: AVIATION TURBINE GASOLINE (ATG)

SECTION III COMPOSITION

COMPONENTS	ALLOWABLE LIMITS (8 HR)	% (VOL)	CAS #
Complex mixture of aliphatic and aromatic hydrocarbons (C_6 - C_{14})*	300 ppm (vapour)	100	64741-41-9

* Contains trace amounts of conventional gasoline additives such as antioxidant, anti-static additive and king inhibitor (2-Methoxyethanol)

** Petro-Canada recommendation.

SECTION IV PHYSICAL DATA

Density (at 15°C)(60°F): (approx)	0.750-0.801 kg/L (57 - 45 API)	Boiling point/ Range (at 1 atm):	50 - 250° C (122 - 482°F)
Vapour Pressure (at 25°C)(77°F): (approx)	21 kPa (3.05 psi) RVP max.	Percent Volatile (at 20° C)(68°F):	100% in 8 hrs
Vapour Density (at 20°C)(68°F):	3.5 (approx.)	Evaporation Rate:	0.7 - 1.2 (n-butyl acetate = 1)
Solubility in water:	Insoluble	Freezing Point:	-51° C (max)(-59.8°F)
Viscosity: (Kinematic)	(< 7 cSt (@ 38° C) (<48.5 SSV at 100°F)	Appearance & Odor:	Colorless, clear liquid with hydrocarbon odour.

Material Trade Name: AVIATION TURBINE GASOLINE (ATG)

SECTION V	FIRE AND EXPLOSION DATA
Flash Point (method used = TCC):	-25°C (minimum)(-13°F)
Flammable limits in air (% by volume):	Lower 1.3% Upper 7.6%
Auto-Ignition Temperature:	240°C (464°F)
Fire and Explosion Hazards:	Easily ignitable by flame or spark. Vapours are heavier than air and may travel considerable distance to sources of ignition and flash back. do not cut, drill or weld empty containers.
Extinguishing media:	Foam, dry chemical, carbon dioxide for small fires, water spray.
Firefighting Procedures:	Use full protective equipment and self-contained breathing apparatus. Stop flow. Contain spill. cover with exting- uishing agent. Use water spray to cool fire-exposed containers and as a protective screen. isolate all ignition sources in area of spill. Use gas detector in confined spaces. To avoid spreading fire do not point solid water stream directly into burning product.

EXTREME FIRE HAZARD

SECTION VI	HEALTH HAZARD INFORMATION
Toxicity Data:	Estimated acute LD_{50}>1400 mg/kg (rat, oral): practically non-toxic.
<u>Effects of Overexposure</u>	
Inhalation:	Irritation of nose and throat; headache, nausea, vomiting, dizziness, fatigue, light-headedness, reduced co-ordination and unconsciousness; central nervous system depressant; kidney and liver damage from long-term exposure. May be narcotic in high concentrations.

Material Trade Name: AVIATION TURBINE GASOLINE (ATG)

Skin and Eyes:	Drying, cracking or inflammation of skin. Prolonged exposure to skin may cause dermatitis. Eye contact may cause irritation, but not permanent damage.
Ingestion:	Overexposure due to ingestion is unlikely for adults since taste and smell limit the amount swallowed. Harmful or fatal if swallowed.

NOTE 1: AVOID BREATHING VAPOUR. AVOID CONTACT WITH SKIN AND EYES. AVOID ASPIRATION.

NOTE 2: Aviation Turbine Gasoline contains a small quantity of benzene which is a suspect human carcinogen.

Emergency and First Aid Procedures Information

Skin:	Remove contaminated clothing - launder before reuse. Soap and water wash. Discard saturated leather articles.
Eyes:	Copious warm water flush - 15 minutes. Physician assessment mandatory.
Inhalation:	Evacuate to fresh air. Apply Cardio Pulmonary Resuscitation if required. Administer oxygen if available. If resuscitation required, physician assessment mandatory.
Ingestion:	DO NOT INDUCE VOMITING. If vomiting - take care to prevent aspiration. give 250 ml. (1/2 pint) of milk to drink. Mandatory physician assessment.
Notes to Physician:	Gastric lavage should only be done after endotracheal intubation in view of the risk of aspiration which can cause serious chemical pneumonitis for which antibiotic and corticosteroid therapy may be indicated.

Material Trade Name: AVIATION TURBINE GASOLINE (ATG)

SECTION VII	REACTIVITY DATA
Stability:	Stable under normal storage and use.
Conditions to avoid:	Sources of ignition, heating greatly increases fire and explosion hazards.
Materials to avoid:	Strong oxidizing agents (nitric acid, sulfuric acid, chlorine, ozones, peroxides, etc.) which causes detonation on contact.
Hazardous decomposition products:	CO_x, SO_x, partially acidized hydrocarbons, smoke on combustion.
Can hazardous polymerization occur?	No.

SECTION VIII	SPILL OR LEAK PROCEDURES
Steps to be taken if material is released or spilled:	Evacuate personnel. Avoid contact. Use full protective equipment and breathing apparatus. Eliminate ignition sources. Shut off source of spill. Absorb with inert absorbent such as dry clay, sand or diatomaceous earth, commercial sorbents, or recover using electrically grounded explosion-proof pumps. Place absorbent in closed metal containers. DO NOT FLUSH TO SEWER. Large spills may be pumped from upwind locations using vacuum trucks and extended hoses. Large pools may be covered with foam to prevent vapour evolution. Immediate shut down and evacuation if wind shifts. Constant monitoring for explosion hazard is required.
Waste Disposal Method:	Incinerate at licensed waste reclaimer facility.

Material Trade Name: AVIATION TURBINE GASOLINE (ATG)

SECTION IX	SPECIAL PROTECTION INFORMATION
Ventilation:	General ventilation. Use explosion-proof mechanical ventilation suitable for group D atmospheres. Local exhaust, if necessary, to control vapours to allowable limits.
Respiratory Protection:	Up to 3000 ppm, use an approved full-face organic vapour cartridge respirator. Above this level, use full-face air-supplied or self-contained breathing apparatus.
Protective Gloves:	NITRILE, VITON.
Eye Protection:	Chemical goggles.
Other Protective Clothing:	Nitrile protective clothing to prevent all contact. DO NOT USE NATURAL RUBBER, NEOPRENE OR PVC (polyvinyl chloride).

SECTION X SPECIAL PRECAUTIONS

HANDLE AS EXTREMELY FLAMMABLE LIQUID. DO NOT USE AS CLEANING FLUID OR SIPHON BY MOUTH. Store in cool, well-ventilated area. Electrically ground/bond during pumping or transfer to avoid static accumulation. PRECAUTIONS SHOULD BE TAKEN TO MINIMIZE SKIN CONTACT AND INHALATION. High standards of personal hygiene are necessary. Wash skin thoroughly with soap and water after contact and before eating. Launder work clothes frequently. Petro-Canada recommends an allowable exposure of 300 ppm when handling AVIATION TURBINE GASOLINE.

SECTION XI REFERENCES

ACGIH, Threshold Limit Values and Biological Exposure Indices for 1987-88.
CONCAWE, First Aid Measures, Medical Toxicology Data and Professional Advice to Clinicians on Petroleum Products, February 1983.
API, Petroleum Process Stream Terms Included in the Chemical Substances Inventory Under the Toxic Substances Control Act (TSCA), 1983.
Environment Canada Manual for Spills of Hazardous Materials, March, 1984.
NIOSH, The Industrial Enviroment - Its Evaluation and Control, 1973.
Patty's Industrial Hygiene and Toxicology, 3rd Edition, Vol. 2B, 1981.
API, The Toxicology of Petroleum Hydrocarbons, May, 1982.
API, API Project # 1443, September 12, 1980.
API, In Vitro and In Vivo Mutagenicity Studies, Final Report, August 13, 1979.

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2. *Frontier Discoverer* Fuel Transfer Procedures

Fuel Transfer Procedures: Frontier Discoverer

Prior to taking part in any bunker transfer operations, the Chief Engineer shall ensure that any assistants are fully conversant with the system and understand the implications of the MARPOL regulations.

All persons involved in bunker fuel transfer shall read and understand the posted bunkering procedures.

Prior to working material fuels, crew members are advised to consult the relevant Material Safety Data Sheet (MSDS) in order to familiarize themselves with the potential health risks caused by “inhalation”, “skin contact”, and “ingestion”.

A list of all persons involved in the bunker operation shall be posted in a prominent position.

The Chief Engineer will coordinate with the Chief Officer regarding the possible transfer of ballast to ensure the ship remains in a proper list and trim.

The Chief Engineer will conduct a pre transfer conference with the bunker suppliers, or with the appropriate ship staff for an internal transfer. Ensure sequence of loading/transfer is verified.

The Chief Engineer will check the requirements are carried out, and sign the pre-transfer shore/ship, ship/ship, and bunker checklist forms as appropriate.

Bunker Fuel Transfer Procedure:

1. Suspend all hot work permits.
2. Terminate all internal transfers if in progress.
3. Ensure all fuel storage tank valves are closed.
4. Take a full set of soundings.
5. Clean the inlet strainer and zero the meter count.
6. Liaise with Bridge to confirm which tanks are being filled.
7. Confirm that the bunker connection save all is drained.
8. Ensure deck scuppers are plugged.
9. Check spill kit is on location and complete.
10. Where appropriate, ensure red light and bunker flag are deployed.
11. Bunkering stations to be manned continually during the entire operation.
12. Check hose and bunker line is clear. Make the connection and secure the hose.
13. Establish communication between E.C.R. Bridge and bunker station and fueling vessel.
14. Confirm the pumping rate and quantity to be pumped with fueling vessel.
15. Bridge to make P.A. announcement regarding the start of fueling operations.
16. Ensure any heading or position changes are communicated to the fueling vessel.
17. Open the bunker station valves and tank valves.

18. Start the operation.
19. 10 minutes after starting take a sample. (check the sample with the senior watchkeeper. If ok continue bunkering operations)
20. Take a sample in the middle of the operation. (check sample with senior watchkeeper. If ok continue bunkering operation)
21. Take manual soundings throughout the operation.
22. Always aim to finish on a non full tank.
23. At completion close tank and bunker station valves.
24. Before disconnecting hose, confirm quantity received.
25. Secure bunker hose so that end is over save all.
26. Inform Bridge of terminating operations. Hot work permits may be resumed.
27. Bridge to make P.A. announcement regarding termination of fueling operations.
28. Ensure oil record book is completed with correct information. Also make entries in engine room and deck logs.

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3. Oil Spill Response Vessel and Barge Fuel Transfer Procedures

OSRV Fuel Transfer Procedure

Ship's Fuel Oil
Transfer Procedure
Per
33 CFR 155.750

M/V _____

North American Hull Number 235
Edison Chouest Offshore, LLC
August 17, 2005

Table of Contents

Introduction

This fuel oil (F.O.) transfer procedure is prepared in accordance with 33 CFR 155.750. It is a requirement for the vessel personnel to use this transfer procedure for each transfer of F.O. to (Loading), from (Off-Loading), and within the vessel (transferring). This procedure is to be kept in a place where it can be easily seen and used by members of the crew when engaged in transfer operations. Any exemptions or alternatives granted must be placed in front of the transfer procedures.

(1) Fuel Oils Transferred - Description and Safety Precautions

Diesel Oil (D.O.) is a light brown, non-viscous liquid that has an odor similar to kerosene. It has a flash point between 110 and 190 deg F and an autoignition temperature of 494 deg F. D.O. is both a skin and eye irritant. Safety precautions should be taken when handling, such as wearing protective gloves and glasses. Keep sparks, flames and other sources of ignition away. In case of a leak or spill, notify personnel on notification list in part (9) of this procedure. When large spills occur evacuate area and remove all sources of ignition. In case of a fire (class B) isolate hazard area and begin extinguishing the fire with the use of carbon dioxide, dry chemical, foam, or water fog. Direct application of water or foam to a pool of D.O. can cause frothing and thereby increase the fire.

(2) Fuel Oil (F.O.) Transfer System

The fuel oil transfer system can be arranged to load from the on deck fuel oil fill/discharge connection, off-load fuel oil from the on deck fuel oil fill/discharge connection or from the rig fuel oil discharge connection or transfer fuel oil between the various tanks within the ship. Diagrams of the fuel oil transfer piping drawing and vents piping drawing are after this procedure.

Tanks and Pumps:

Tanks	Location	Capacity (Gal.)
FO #2-P	21 - 41	22755
FO #2-S	21 - 41	21919
FO #3-C	41 - 57	19484
FO #4-C	57 - 73	22078
FO #5-C	73 - 92	23376
FO #5-P	73 - 92	25043
FO #5-S	73 - 92	25043
FO #6-C	92 - 112	26945
FO #6-P	92 - 112	21535
FO #6-S	92 - 112	21535
FO #7 P	107 - 116	12172
FO #7 S	107 - 112	12172
FO DAY TANK-P	29 - 34	13528
FO DAY TANK-S	27 - 34	18345
FO OVERFLOW-P	36 - 41	2516.2

Pumps

1) Fuel Oil Cargo Pump
   Located @ Frame 40
   Aurora 344A 4"x5"x 9a
   75 HP, 3600 RPM Motor
   760 GPM @ 290 TDH, 480V

2) Fuel Oil Transfer Pump
   Located @ Frame 36
   Barnes 25CCE 3"x3"
   15 HP, 3600 RPM Motor
   320 GPM @ 115 TDH, 480V

3) Maximum Transfer Rate For Cargo and Transfer Pumps Combined: 1080 GPM

Note: TDH indicates total head (in feet) developed across pump.

3

Transferring

The fuel oil cargo pump is used primarily for transferring fuel from the vessel to offshore drilling rig installations. The fuel oil transfer pump is used primarily for transferring fuel oil between the various fuel oil tanks within the vessel. The procedure for transferring fuel oil to and from any combination of two (2) different tanks is as follows:

1. Ensure the F.O. pumps are off.

2. Ensure the following valve line-up is correct and performed in the order given before beginning any transfer (valves can be referenced on the system diagram after this procedure):

   a) Close the following valves:
      1) All F.O. tank fill valves,
      2) All F.O. tank suction valves,
      3) F.O. transfer pump discharge valve(s) for deck connections

   b) Open the following valves:
      1) Appropriate F.O. tank suction valve for tank being transferred from (including appropriate tank valve)
      2) F.O. transfer pump suction valve from suction header
      3) F.O. transfer pump discharge valve to fill header
      3) F.O. meter inlet and outlet valves (if required)
      4) Appropriate F.O. tank fill valve for tank being transferred to (including appropriate tank valve)

3. When communication is established (via sound powered phone, intrinsically safe VHF, or other acceptable means) and the personnel are in their proper positions in accordance with the rest of these procedures - transferring may begin at the order of the person in charge to begin pumping. Inspect entire line-up for leaks after pumping is started.

4. When transferring is complete the system should be secured in accordance with part (8).

Loading

The fuel oil transfer piping system is designed to allow either simultaneous or individual loading (filling) of any combination of the various fuel oil tanks within the vessel from the main deck fuel oil fill/discharge connections. The procedure is as follows:

1. Ensure the F.O. pumps are off.

2. Ensure the following valve line-up is correct and performed in the order given before beginning any transfer (valves can be referenced on the system diagram after this procedure):

   a) Close the following valves:
      1) All F.O. tank fill valves,
      2) All F.O. tank suction valves,
      3) F.O. meter inlet and outlet valves
      4) F.O. transfer pump discharge valve for deck connections

   b) Open the following valves:
      1) Appropriate F.O. tank fill valve(s) for tank(s) being filled (including appropriate tank valves)
      2) F.O. fill valve from deck connection
      3) Main deck F.O. fill/discharge connection and flange - being ready to catch any fuel still in the pipe with a bucket and making immediate hose connection with gasket.

3. When communication is established (via sound powered phone, intrinsically safe VHF, or other acceptable means) and the personnel are in their proper positions in accordance with the rest of these procedures - transferring may begin at the order of the person in charge to begin pumping. Inspect entire line-up for leaks after pumping is started.

4. When loading is complete the system should be secured in accordance with part (8).

Off-Loading

The fuel oil transfer pumps are capable for simultaneous or individual off-loading to an offshore drilling rig installation of any combination of the various fuel oil tanks within the vessel or in the event of dry-docking of the vessel and it is needed. The procedure is as follows:

1. Ensure the F.O. pumps are off.

2. Ensure the following valve line-up is correct and performed in the order given before beginning any transfer (valves can be referenced on the system diagram after this procedure):

   a) Close the following valves:
      1) All F.O. tank fill valves,
      2) All F.O. tank suction valves,
      3) F.O. meter inlet and outlet valves

   b) Open the following valves:
      1) Appropriate F.O. tank suction valve(s) for tank(s) being transferred (including appropriate tank valve)
      2) F.O. transfer pump suction valve from suction header
      3) F.O. transfer pump discharge valve to appropriate deck discharge connection
      4) Main deck F.O. discharge connection - being ready to catch any fuel still in the pipe with a bucket and making immediate hose connection with gasket.

3. When communication is established (via sound powered phone, intrinsically safe VHF, or other acceptable means) and the personnel are in their proper positions in accordance with the rest of these procedures - transferring may begin at the order of the person in charge to begin pumping. Inspect entire line-up for leaks after pumping is started.

4. When off-loading is complete the system should be secured in accordance with part (8).

(3) Personnel Requirement for Fuel Oil Transfer

For loading and off-loading of fuel oil, a minimum of one person in charge and two transfer personnel are required to be on duty for the entire duration of the operation.

For transferring of fuel oil between the tanks within the vessel a minimum of one person in charge and one transfer personnel are required to be on duty for the entire duration of the transfer operation.

(4) Duties of Required Personnel for Fuel Oil Transfer

Duties of Person in Charge

The person in charge is designated by the operator and shall hold a valid license as a master, mate, pilot, engineer, or operator. The person in charge will generally be attending duties in the pilothouse but may be temporarily below deck as required. In the event that the person in charge is not in the pilothouse, a designed person with communications capabilities must be in the vicinity of an emergency shutdown switch. The person in charge is responsible for seeing that the following is accomplished:

1. Assume responsibility for the vessel in filling out the declaration of inspection before commencing transfer operations. All items on this declaration must be fully understood and agreed upon by the deliverer and recipient of cargo and any discrepancies will be noted in writing.

2. Read, understand, and follow this procedure.

3. Expedite transfer of fuel oil without causing any damage to the vessel, its equipment or environment.

4. Constantly watch for any changes in condition that could cause any spill.

5. Notify the proper person(s) in case of a spill. The procedure for spill reporting is found in part (9) of this procedure.

6. Proper tending to the vessel's moorings as specified in part (5).

7. Take charge of all topping operations as specified in part (7).

8. Properly secure vessel and equipment upon termination of transfer as specified in part (10).

9. Remove all spillage from containment boxes as specified in part (8).

10. Instruct and direct the transfer personnel.

Duties of Transfer Personnel

The person in charge designates the transfer personnel. Acceptable transfer personnel shall include; persons designated by the person in charge, qualified deck hands, AB/OS, or qualified crew. Passengers or persons other than crew will not be acceptable for use as transfer personnel. For loading and off-loading one-transfer personnel will be located at the appropriate deck connection and another transfer personnel will be located in the engine room attending the transfer equipment. For transferring operations (within the vessel) it is not necessary to have a transfer personnel located on deck. The transfer personnel are responsible for seeing that the following is accomplished:

1. Follow instructions of the person in charge.

2. Maintain communication with the person in charge.

3. Initiate an emergency shut-down to stop the transfer operation whenever oil or hazardous material from any source is discharged:
    1. In the transfer operation work area; or
    2. Into the water or upon the adjoining shoreline in the transfer area.

4. Immediately report any spills or leakage or potential hazards to the person in charge.

(5) Mooring Duties for Oil Transfer

Deck Officer on Watch - In charge of tying up and letting go of mooring. Insure proper signals hoisted or lit aloft and scuppers plugged.

Bosun, AB's, & OS's - Assist as directed in mooring. Rig ladder during ship to barge operations.

(6) Emergency Shut-Down

For loading, immediate means of communication with the fueling facility must be made available in order to request that the pumping be stopped if an emergency shutdown were to become necessary. If loading from a barge, an emergency stop switch should be given to the vessel by the barge unit.

For off-loading fuel from the ship or transferring fuel within the ship, immediate communication with the transfer personnel attending the transfer equipment is necessary in order to request that the pumping be stopped and appropriate valves be closed. In the event that an emergency shut-down is necessary, appropriate personnel must activate the shut-down. An emergency stop button for the pumps is located on the control panels. These control panels are located in the pilothouse, near the liquid mud and fuel oil fill connection on main deck, and on the local pump control panel.

The person in charge must be able to maintain communication with the barge or shore side fueling facility and transfer personnel via voice, sound powered phone, or portable radio. If portable radios are used they must be intrinsically safe as defined in 46 CFR 110.15-100 and 46 CFR 11.80.

(7) Topping Off

During topping off operations, the flow shall be continually reduced to a level that will allow controlled closure of the discharge valve to that tank and precludes overfilling or spillage. The tanks shall be continuously sounded to ensure tank levels during the topping off phase and continuous communication between the transferring and sounding personnel must be maintained. This phase of the transfer procedure is the most critical and requires the full attention of the person in charge.

(8) Transfer Completion

Once the transfer is complete: all pumping is stopped, all fill valves are closed, all connections drained and removed, and blank flanges replaced and secured with gaskets. The person in charge visually checks all valves and flanges to be sure they are closed after the oil transfer is complete.

Emptying of the Discharge Containment Areas

Containment areas are to be drained and cleaned so as to prevent any oil from spilling overboard. This is to be done by using a hand pump, rags, and/or absorbents. Collected spillage shall be properly disposed of to prevent any re-release because of torn bags or faulty containers. In addition to the required fixed containment area, at each oil tank vent, overflow, and fill pipe a 5 gallon portable container and rags should be placed to clean and collect any oil that might have spilled.

(9) Accidental Oil Discharges

AS SOON AS A SPILL IS SIGHTED, IMMEDIATE ACTION SHALL BE **TAKE**N TO STOP OR REDUCE THE SOURCE. REFER TO THE SHIPBOARD **OIL** POLLUTION EMERGENCY PLAN. REPORT ALL SPILLS TO EDISON **CHOUEST** OFFSHORE DISPATCHER OR PERSON IN CHARGE AT (985) **632-7144,** THEN TO THE U.S. COAST GUARD AT 1-800-424-8802.

(10) Closing and Opening the Vessels Openings

The person in charge is to ensure that the vessel is properly secured and equipment stowed upon transfer completion. This includes, but is not limited to:

1. Dogging of all hatches, ullages, doors vents, sounding ports, and any other vessel openings that maintain the seaworthy condition of the vessel and prevent the inadvertent release of oil or hazardous material in the event of an accident.

2. Securing booms, cargo hoses and any other gear that is not permanently fastened to the hull that might move while the vessel is underway.

3. Closing of all fuel valves necessary to prevent shifting of fuel.

4. Remove all spillage from containment boxes using rags or "sugie" cloth to soak up excess oil.

(11) Transfer Hose Markings

Hoses used for the transfer of hazardous materials are to be marked or stenciled as follows, with:

1. The name of the product for hose intended service.

2. Maximum working pressure.

3. Minimum service temperature for service at other than ambient temperature.

4. Manufacture date.

5. Date of latest possible pressure testing in accordance w/ USCG 33 CFR 156.170.

OIL TRANSFER PROCEDURES
POINT THOMPSON CLASS

This statement of oil transfer procedures is to meet USCG 33 CFR 155.720. It addresses: (a) transfers of oil to or from the vessel, and (b) transfer of oil from tank to tank within the vessel. It must be posted or available at the on-deck fueling station during all oil transfer proceedings.

This procedure applies only to the following vessels:

POINT BARROW
POINT MILNE
POINT OLIKTOK
POINT THOMPSON

1. List each of the products transferred to or from the vessel, including the following information:

   (i) Generic or chemical name,

   (ii) Cargo information as described in 154.310 (a), (5), (ii) of this chapter, and

   (iii) Applicability of oil transfer procedures.

   (i) The vessel carries two separate petroleum products: (a) #2 Diesel Fuel and (b) lubricating oil. The #2 Diesel Fuel is a Grade D petroleum product. The lubricating oil is a Grade E petroleum product. Attached are the Material Safety Data Sheets for each product.

   (ii) The following cargo information applies to #2 Diesel Fuel

Section (a):	Oil: Fuel Oils: Number 2 – D
Sections (b) through (g):	See attached Material Safety Data Sheets

   The following cargo information applies to the lubricating:

Section (a):	Oil: Lubricating
Sections (b) through (g):	See attached Material Safety Data Sheets

   (iii) Each product applies to and will be addressed in the following procedures of oil transfer.

2. Describe each of the transfer systems on the vessel, including:

   (i) A line diagram of the vessels oil transfer piping, including the location of each

valve, pump, control device, vent, and overflow;

(ii) The location of the shutoff valve or other isolation device that separates any bilge or ballast system from the oil transfer system; and

(iii) A description of any procedure for emptying the discharge containment system as required by 155.310 and 155.320.

(i) Attached are drawings that show all piping, valves, and vents for the oil transfer system on the vessel. The vessel is fitted with 7 diesel oil tanks and 2 lubricating oil tanks, for a total capacity of 72,310 gallons of petroleum products. Each tank is filled only through a main deck stand pipe. There are no valves in the system between the fuel line on the main deck and the tank. Each fuel tank is interconnected by fuel suctions. All engines return their fuel to the 2 centerline fuel tank. This is the only fuel transferring capability on the vessel.

The vessel's fuel tank fill lines have no shutoff valves. The dock facility hose must have either an automatic back pressure nozzle or a quick closing shutoff valve.

NOTE: The tug Pt. Thompson and Pt. Oliktok are fitted with a fuel pump, hose, nozzle and hose reel so it can discharge fuel off the vessel. This pump cannot be used for internal fuel transfers.

(ii) All vessels in this class do not have any connections between the bilge or ballast system and the oil transfer system.

(iii) As listed for vessels (100 gross tons but less than 300 gross tons):

Equip each fuel oil or bulk lubricating oil tank vent, overflow, and fill connection with a portable container of at least 5 U.S. gallon capacity during oil transfer operations.

Disposal of these containers pursuant to 155.320, the portable containers will be carried to the engine room and pumped into the waste oil or contaminated oil tank using the appropriate pump.

The vessel's lubricating oil tank fills make containment impractical. The products for these tanks will be transferred using a back pressure shut-off nozzle.

3. List the number of persons required to be on duty during the oil transfer operations.

The Chief Engineer and one assigned person from the Deck Department is required to be on duty during the oil transfer procedure.

4. List the duties by title of each officer, person in charge, tankerman, deckhand, and any other person required for each oil transfer operation.

The vessel's Chief Engineer is the designated Person In Charge (P.I.C.) of the oil transfer. The assigned Deck Department assistant is responsible to the P.I.C. and will assist him as directed.

5. List the procedures and duty assignments for tending the vessel's moorings during the transfer operations.

   The deckhand or Deck Department officer on watch will be responsible for tending the mooring lines, or seeing that they are properly tended. The P.I.C. and his assistant shall not tend to mooring lines if it takes them away from their oil transfer duties.

6. List the procedures for operating the emergency shutdown and communication means required by 155.780 and 155.785 respectively.

   The emergency shutdown procedure on board the vessel is the main deck valve at the deck fill station. This valve is the usual operating station of the P.I.C. of the oil transfer operation.

   The communication means required in 155.785 applies during vessel to vessel oil transfer transfers. A portable radio device may be used to comply with this paragraph. When deemed proper, voice communication is also sufficient. Conditions such as vessel proximity, weather, and time of day dictate which form of communication is necessary.

7. List the procedures for topping off tanks.

   Tanks will be topped off at reduced flow rates. This shall be accomplished by having the Marine Terminal Operator (M.T.O.) reduce the loading rate. The system for topping off shall be discussed during the pre-transfer conference, as detailed in the Declaration of Inspection. Topping off procedures will commence when the tank is at the 80% capacity amount. Tanks will be filled no more than a maximum of 12 inches from the tank top.

8. List the procedures for ensuring that all valves used during the oil transfer operation are closed upon completion of transfer.

   Upon completion of any transfer, the specific manifold, tank, or header valves will be closed. Upon completion of fuel transfer, the deck fill standpipe or tank fill cap will be closed and the camlock cover installed as a safety precaution.

9. List the procedures for reporting oil discharges into the water.

   If a spill occurs, take the following steps:

   (a) Stop all transfers,
   (b) Stop flow of oil into the water if possible,

(c) Immediately report the spill to the United States Coast Guard, the nearest Crowley office, and to your supervisor. The toll free number for reporting spills to the USCG is:

1-800-592-9911 Group Seattle
or
1-800-424-8802 National Response Center

10. List the procedures for closing and opening the vessel openings as described in 155.815.

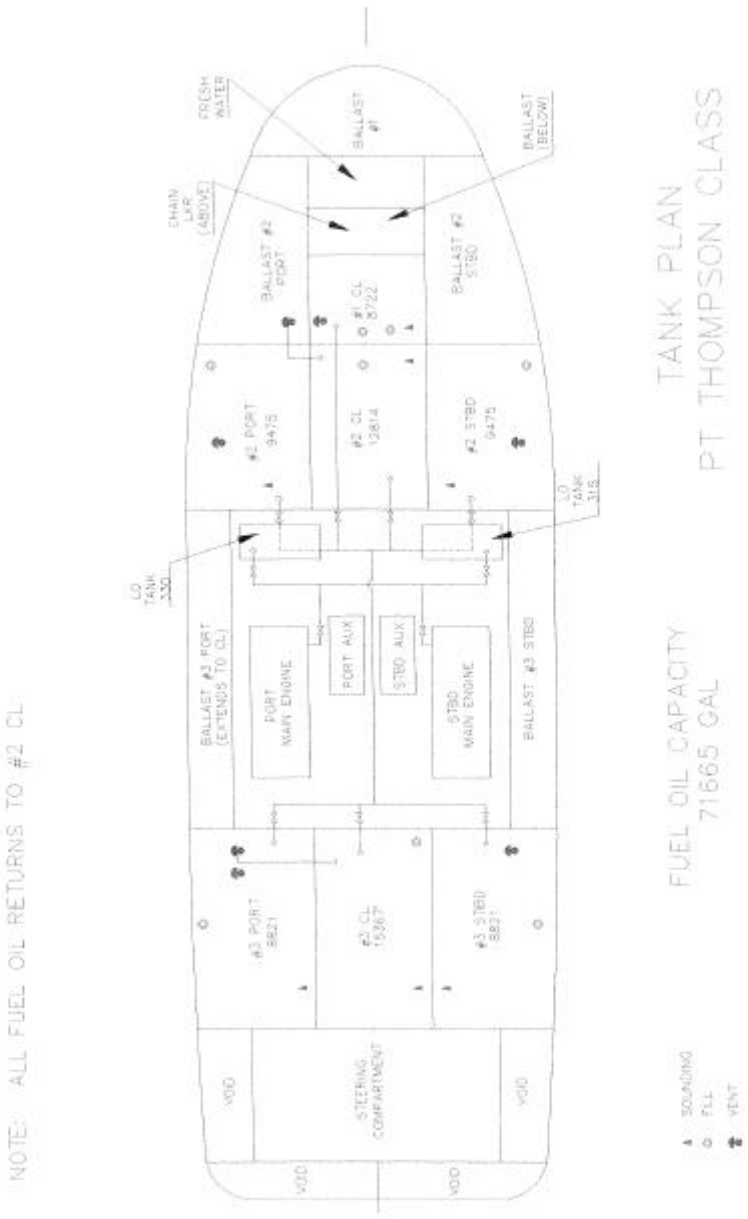
Prior to commencing oil transfer operations, all manhole covers, ullage openings, freeing ports, and scuppers will be properly closed. Only those sounding tubes of tanks being filled will be open. Bulwark openings will be blocked off plugs. Vessels built prior to 1986 can utilize wooden damage control plugs to seal bulwark openings. Vessels built after 1986 must use threaded pipe plugs or caps to seal off bulwark openings. All freeing ports will be blocked with absorbent bags.

Vents will be fitted with 5 U.S. gallon containers if they are not within fixed on-deck containment. Any other opening that maintains the sea worthy condition of the vessel and prevents the inadvertent release of oil in the event of a tank vessel accident must be kept closed.

11. List any statements explaining that each hazardous material transfer hose is marked with either the name of each product which may be transferred through the hose or with letters, numbers or other symbols representing all such products and the locations in the transfer procedures where a chart or list of the symbols used and a list of the compatible products which may be transferred through the hose can be found for consultation before each transfer.

The vessel carries three sections of 3 inch petroleum product transfer hoses, intended for use solely for #2 diesel fuel. Each hose is tested annually and stenciled with the date of the test and the Maximum Working Pressure.

No additional amendments are incorporated in the oil transfer procedures as required under 33 CFR 155.760


TANK PLAN
PT THOMPSON CLASS
FUEL OIL CAPACITY
71665 GAL
NOTE: ALL FUEL OIL RETURNS TO #2 CL
FRESH WATER
BALLAST #1
BALLAST (BELOW)
CHAIN LKR (ABOVE)
BALLAST #2 PORT
BALLAST #2 STBD
#1 CL 8722
#2 PORT 9475
#2 CL 13814
#2 STBD 9475
LO TANK 316
LO TANK 330
BALLAST #3 PORT (EXTENDS TO CL)
PORT MAIN ENGINE
PORT AUX
STBD AUX
STBD MAIN ENGINE
BALLAST #3 STBD
#3 PORT 8821
#3 CL 15867
#3 STBD 8821
VOID
STEERING COMPARTMENT
VOID
VOID
VOID
SOUNDING
FILL
VENT

APPENDIX D:
OIL AND DEBRIS DISPOSAL PROCEDURES

INTRODUCTION

The collection, storage, transportation, treatment and disposal of waste will be conducted in a manner that is both safe and environmentally sound. Procedures are in place to insure that all laws and regulations are followed and that necessary permits are obtained in conjunction with waste management.

Wastes generated from an oil spill response will be handled in accordance with federal and state hazardous waste regulations and company policy. Most of the waste collected during response operations will be classified as exploration and production exempt waste .

However, crude oil contains benzene, which can be considered hazardous waste under the Resource Conservation and Recovery Act's (RCRA) toxicity characteristic rule. The hazardous waste characteristics include ignitability, reactivity, corrosivity and toxicity. Oily waste will be tested before a disposal option is selected. Benzene will nokrmally volatilize rapidly from a spill. If oily waste is determined to be hazardous under RCRA, it will be labeled accordingly and sent to a permitted facility for disposal.

In the event of a spill, a site-specific waste management plan will be developed to address the equipment, staffing, and other support necessary to address waste management issues under the known conditions of the spill. The template for the Shell Waste Management Plan (which will be attached to the Incident Action Plan) is provided in Figure D-1. If an oil spill occurs during Shell's Beaufort Sea exploration operations, wastes may be generated offshore, near shore, and onshore.

WASTE CATEGORIES

Oil spills can result in several different types of generated wastes including those listed below. This waste may include oiled personal protective equipment (PPE), possible shoreline debris, and oily sorbents.

- **Oily Liquid Wastes**
  - Recovered or skimmed mixtures
  - Used engine oils, hydraulic fluids
  - Fuels contaminated with water and solids
  - Engine room bilge/ballast waters from vessels
  - Wash waters from cleaning boats, equipment, and gear
  - Other oily waters

- **Non-Oily Liquid Wastes**
  - Sewage, liquid human waste (gray and black waters)

- **Oily Solid Wastes**
  - Sand, gravel, tar balls
  - Asphalt patches
  - Sludge
  - Sorbent pads/boom/wood
  - Shoreline vegetation
  - Oily personnel gear and clothing
  - Damaged response equipment and gear
  - Empty drums and containers

- **Non-Oily Solid Wastes**
  - Domestic trash and garbage
  - Bagged human waste
  - Discarded equipment and construction materials

Wildlife carcasses and contaminated fish may be retained by trustee agencies. Once they are released or determined to be solid wastes, tier disposal will comply with applicable regulations.

COLLECTION AND SEGREGATION OF RECOVERED OIL

- Oil and emulsion from offshore oil recovery will be transferred from skimmer vessels with storage tanks or barges to the Arctic tanker for storage and ultimate disposal.

- Oil and emulsion from near shore oil recovery will be collected with shallow draft vessels and/or mini-barges. Mini-barge would be used for temporary storage of oily liquid wastes.

- Oil and emulsion from shoreline oil recovery will be collected with skimmer systems and pumped off into holding tanks. Each tank's oil and free-water volumes will be gauged and logged, and then pumped to mini-barges or other storage containers. Solid waste and debris will be removed and brought to a segregated interim storage area.

OIL AND DEBRIS SEPARATION AND DISPOSAL

Oil spill cleanup offshore using mechanical recovery will involve the further handling of recovered oil and oiled materials. These should be transported from offshore to the staging area for proper handling or from onshore directly to the appropriate reclamation/ disposal site.

Figure D-2 depicts separation methods for recovered oil/water/debris. The figure also depicts methods that may be employed to separate free and/ or emulsified water from the oily liquid waste.

TEMPORARY STORAGE OF RECOVERED OIL AND WASTE

- Oil recovered at sea via skimmer(s) is transferred to portable tanks onboard recovery vessels or barges.

- The skimmer tanks allow for gravity separation of the oil from the water. The separated water is transferred through a hose and discharged forward of the recovery pump. This method is called "decanting." This process is vital to the efficient mechanical recovery of spilled oil because it allows maximum use of limited storage capacity, thereby increasing recovery operations. Approval must be obtained from the USCG and respective State agencies by the Incident Management Team Liaison Officer prior to decanting.

- Recovered fluids stored onboard the Arctic tanker will be disposed of at a Shell Group refinery or a 3rd part processor.

- Oiled debris collected at sea requires specific handling. Contaminated materials should be placed in leak proof, sealable containers on the recovery vessels and transported to appropriate facilities for processing, recycling, or disposal.

- Oil recovered from onshore areas will typically contain substantial quantities of water and debris. Excess water, sand, and other beach materials greatly increase the quantity of waste and its associated cost for transportation, processing, and disposal. To remedy this, different methods can be employed at the cleanup site to separate oiled debris from excess materials that may be returned to the shoreline. Using screens, filters, conveyor systems and settling tanks, oil/ water mixtures can be drained from debris and collected in temporary containers for further treatment.

- Clean sand and beach materials can be separated from oiled materials.

- Oil spills would occur in remote sites that are some distance from transportation routes and storage facilities. In these situations, temporary on-scene storage arrangements may be required. Oil may be stored in tanks, 55-gallon drums, bladders, or empty fuel storage tanks. Such tanks permit decanting of water from the oil. These pits should be lined with plastic sheeting to prevent oil leakage and soil penetration.

- Contaminated gravel will be temporarily stored on site and later transported by vessel or air off site to a designated waste treatment or disposal facility.

DISPOSAL REGULATIONS

- Oiled Materials – If these materials have not contacted extraneous substances, they will be disposed of at a Shell approved disposal site.

- Oil and oily wastes that are contaminated or excessively weathered will require transport to an approved disposal site. Any transport or disposal of material that is considered hazardous waste must follow the requirements of the RCRA.

- Regulatory Guidelines

    - All wastes scheduled for disposal at a Prudhoe Bay oilfield facility, with prior written approval from the facility owner, will be handled in accordance with the requirements of the U.S. Environmental Protection Agency (EPA), Alaska Department of Environmental Conservation (ADEC), and Alaska Oil and Gas Conservation Commission regulations and policy guidelines. These regulations and guidelines have been synthesized into an operational document titled, "Alaska Waste Disposal and Reuse Guide" (red book) prepared by BP Exploration (Alaska) Inc. and ConocoPhillips Alaska, Inc. (CPAI) to ensure consistency in waste handling practices on the North Slope. This includes directions for using the North Slope manifest, and other requirements for third party contractors using BP or CPAI facilities.

    - Only state licensed hazardous material haulers are used to transport recovered oil. These licensed waste haulers must have an EPA ID number and a state transporter ID number.

    - When completing the manifest, Shell Exploration and Production is listed in the manifest as the generator. The manifest should be signed by the designated Shell representative, and marked with the statement: "This material is being disposed of by Shell as part of a response action in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300)."

    - Recovered waste oil must be properly packaged and labeled prior to transport in accordance with 40 CFR 262.30.

    - All wastes shipped off-site for disposal must be transported in compliance with applicable regulations. These include the RCRA regulations in 40 CFR 262-263, the DOT Hazardous Materials Regulations in 49 CFR 171-178, and applicable ADEC regulations. Ensure shipments of waste collected during spill cleanup activities are transported in appropriate containers to eliminate secondary releases during transport. If the nature of the waste precludes packaging in the required container, the Incident Commander should request emergency exemptions from the regulations following procedures outlined in 49 CFR 107.

    - Waste haulers will use only state-certified disposal sites.

    - Unit personnel must track the Hazardous Waste Manifest and retain the appropriate records per 40 CFR 262.40. Unit personnel should receive a signed copy of the manifest from a designated disposal facility within the specified time limits.

DISPOSAL TRANSPORTATION AND DESIGNATED SITES

- Transportation of oil and oily waste at sea may be accomplished via barge, OSRV, or tanker.

- Transportation of oil or oily waste from shoreline locations will be by shallow draft vessel, , towed bladders, or air (helicopter sling-loads of small containers, if approved).,
- Oil or oily debris recovered from a spill site may only be disposed of at authorized sites (List is maintained by Shell HSE).

FIGURE D-1
WASTE MANAGEMENT PLAN

Always work safely in an environmentally sound manner. Minimize waste. Consider waste management and generation in all actions. Never mix waste; always segregate. Report any accident or incident to your supervisor immediately. Reference the Waste Management Plan for the specific process required for each waste type.

A. INTRODUCTION

Incident Name: _____

Date of Incident: _____

Time of Incident: _____

Individual in Charge of Site: _____

B. SITE DESCRIPTION

Location of Site: _____

Description of Site Including Surrounding Area (e.g., beach, marsh) - attach map: _____

Access/Limitations (e.g., highway/bridge limitations, boat/shallow water) - attach map: _____

Any Additional Information / Considerations: _____

Present Weather Conditions: _____

12-Hour Forecast: _____

24-Hour Forecast: _____

C. SITE-SPECIFIC SAFETY PLAN

This plan must be completed and attached before starting any physical work. One plan must be completed for each waste handling/storage area.

FIGURE D-1
WASTE MANAGEMENT PLAN

D. TYPE OF WASTE GENERATED FROM RESPONSE OPERATIONS

Wastes generated by oil spill cleanup fall into several different types. Use the following to identify your wastes. Remember - never mix wastes!

Waste Stream	Sources
Non-Hazardous	
- Oily Liquid	Offshore and onshore recovery operations; vessels, vehicle, aircraft and equipment operations; personnel and equipment decontamination operations; waste storage and disposal area storm water runoff control operations; wildlife washing operations; equipment demobilization operations.
- Non-Oily Liquid	Sewage collection operations; gray water collection operations; laundry operations; oil/water separation operations; wildlife rehabilitation operations.
- Oil Solids	Offshore and onshore recovery operations; debris removal operations; in-situ burning operations; site restoration operations; personnel and equipment decontamination operations; equipment demobilization operations; wildlife capture, cleaning and rehabilitation operations.
- Non-Oily Solids	Offshore and onshore recovery operations; debris removal operations; garbage collection operations; construction operations; site restoration operations; wildlife capture, cleaning and rehabilitation operations; equipment demobilization operations.
Hazardous	
Vessels, vehicle, aircraft and equipment operations; dispersant use operations; wildlife rehabilitation operations.	

FIGURE D-1
WASTE MANAGEMENT PLAN

E. CONTAINERIZED AND STORED WASTE

Waste accumulated at spill cleanup sites will have to be containerized and stored. Use **F through K** of possible waste streams to identify temporary storage techniques. Note that each waste stream will have to be classified as to its hazardous nature. Additionally, each container will have to be properly identified and marked for hazard communications as well as properly marked and labeled to meet Department of Transportation requirements before shipment. All hazardous waste must be transported immediately to the nearest shore base for continued storage.

F. TEMPORARY WASTE SITES will have to be identified and established. These sites will need to be in close proximity to the cleanup site. Security requirements must be considered along with the access to outside transportation. These storage areas should be established with the following considerations: distance to living/working areas (cleanup operations as well as the general public), tidal influx, local wildlife impact, security, cleanup of spilled product and rainwater runoff. The following section should be completed for each temporary storage site. To establish security, contact the Logistics Section Chief.

Site Location	Security	Access

G. COMPANY-APPROVED TREATMENT, RECYCLING AND DISPOSAL FACILITIES are listed below. Prior contact must be made with the facility as soon as the waste is identified and an estimated volume is established.

Company Name, Address, Phone Number	Contact (Complete When Called)	Type Waste Approved For

FIGURE D-1
WASTE MANAGEMENT PLAN

H. COMPANY-APPROVED WASTE TRANSPORTERS shall be used to haul all waste. The following is a list of transporters presently used to transport wastes. The shipper must ensure that all Department of Transportation requirements are met. Additionally, all waste must be accompanied by a properly completed manifest or shipping paper. All containers must be secure and strong. All dump trucks or roll-off bins should be lined to prevent spillage or contamination of other areas.

Company Name, Address, Phone Number	Contact (Complete When Called)	Type Waste Approved For

I. WASTE MATERIAL MUST BE CONTROLLED WHEN ENTERING AND LEAVING the storage area. The following can be used to accomplish this task.

Waste Type	Type / # Containers	Control Number	Date IN	Date OUT	Transporter	Disposer	Type / Manifest #

J. If **ADDITIONAL HELP OR ASSISTANCE** is required, immediately contact your on-scene safety or environmental representative or contact the Operations Section Chief or the Safety Officer.

FIGURE D-1
WASTE MANAGEMENT PLAN

K. **EQUIPMENT, MANPOWER AND EXPENDITURES** must be controlled and documented. The following can be used for this purpose. If additional assistance is required for cost control, contact the Finance Section Chief. If additional assistance is required for purchasing or locating equipment or supplies, contact the Logistics Section Chief.

EQUIPMENT					
Waste Handling Equipment	**Vendor**	**S.O. #**	**Days Used**	**Cost Per Day**	**Total Cost**

MANPOWER					
Waste Handling Equipment	**Vendor**	**S.O. #**	**Days Used**	**Cost Per Day**	**Total Cost**

OTHER COSTS (Fuel, Tools, Repair, Container Rental/Purchase, Other Equipment)					
Waste Handling Equipment	**Vendor**	**S.O. #**	**Days Used**	**Cost Per Day**	**Total Cost**

TOTAL COST =

L. **WASTE MANAGEMENT SITES** are identified in **this Section**.

M. Report all **ACCIDENTS/INCIDENTS** immediately to your supervisor. Always work safely and in an environmentally sound manner.

FIGURE D-2
Oil/ Water/ Debris Separation Strategies

The different types of wastes generated during response operations require different disposal methods. Waste shall be separated by material type for temporary storage prior to transport. The following table lists some of the options available for separating oily wastes into liquid and solid components. The table also depicts methods that may be employed to separate free and/or emulsified water from the oily liquid waste.

TYPE OF MATERIAL	SEPARATION METHODS
(1) LIQUIDS	
Non-emulsified oils	Gravity separation of free water
Emulsified oils	Emulsion broken to release water by: • Heat treatment • Emulsion breaking chemicals • Centrifuge • Filter/belt press
(2) SOLIDS	
Oil mixed with sand	• Collection of liquid oil leaching from sand during temporary storage • Extraction of oil from sand by washing with water or solvent • Mechanical sand cleaner • Removal of solid oils by sieving
Oil mixed with cobbles, pebbles or shingle	• Screening • Collection of liquid oil leaching from beach material during temporary storage • Mechanical sand/gravel cleaner • Extraction of oil from beach material by washing with water or solvent
Oil mixed with wood, plastics, seaweed and sorbents	• Screening • Collection of liquid oil leaching from debris during temporary storage • Flushing of oil from debris with water
Tar balls	Separation from sand by sieving

FIGURE D-3
TEMPORARY STORAGE METHODS

Container	On-shore	Off-shore	Solids	Liquids	Notes
Barrels	✓	✓	✓	✓	May require handling devices.
Barges		✓	✓	✓	Liquids only in tanks. Consider venting of tanks.
Oil Storage Tanks	✓	✓		✓	Consider problems of large volumes of water in oil.
Bladders	✓	✓		✓	May require special hoses or pumps for oil transfer.
Pits	✓		✓	✓	Liner(s) required.
Roll-off Bins	✓		✓		Require impermeable liner and cover.
Mud Tanks	✓	✓	✓	✓	500 gallon - 500 Bbls
Frac Tanks	✓	✓	✓	✓	Portable, can be deployed anywhere.

APPENDIX E:
WILDLIFE CAPTURE, TREATMENT AND RELEASE PROGRAMS BEAUFORT SEA OIL SPILL RESPONSE PLANNING

Wildlife Capture, Treatment and Release Programs Beaufort Sea Oil Spill Response Planning

November 2006

Shell Offshore Inc.
3601 C Street, Suite 1334
Anchorage, Alaska 99503

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1.0 EXECUTIVE SUMMARY

Wildlife Permits for Secondary and Tertiary Response:

- Develop a wildlife assessment (affected species, concentrations relative to spill)
- Prepare a plan of operations for protection, hazing, capture, or treatment
- Complete State and Federal permit applications
- Mobilize qualified wildlife response contractors

Resources to develop agency acceptable wildlife response plans, listed in order of preference (Specific contractors are identified in Table 1):

- Local resident possessing traditional knowledge
    - Whaling Captains and crews
    - Alaska Eskimo Whaling Commission (AEWC)
    - Village Elders and Leaders
    - Marine Mammal Observers (MMO)
    - Subsistence Advisors
- Trained Biologists with permit experience
    - ASRC Energy Services, Lynx Enterprises, Inc. (AES Lynx) Personnel
    - Other subcontractor support (ABR, LGL)
- Alaska Clean Seas (ACS)
    - ACS Permits for Birds and Terrestrial Mammals (Tactic W-1)
    - Master Service Agreement with International Bird Rescue and Rehabilitation Center (IBRRC)
    - ACS Mobile Wildlife Stabilization Center
- Wildlife Response Contractors
    - International Bird Rescue and Rehabilitation Center (IBRRC)
        - Their network of subcontractors
    - Medical Support Personnel
- Agency Personnel
    - NSB Department of Wildlife Management
    - Alaska Department of Fish and Game
    - U.S. Fish and Wildlife Service
    - U.S. National Marine Fisheries Service

Table 1
Wildlife Response Contractors

Species	Potential Contractors Wildlife Response Contractors					
	Observe and/or Identify	**Develop Wildlife Assessment**	**Haze**	**Collect and Hold**	**Treat**	**Carcass Collection[4]**
Migratory Birds	AES Lynx[1] ABR[6] , LGL[6]	AES Lynx[1] ABR[6] , LGL[6]	ACS AES Lynx [1]IBRRC	IBRRC[2,3,4]	IBRRC[2]	AES Lynx ACS
Walrus and Polar Bears	AES Lynx[1]	AES Lynx[1]	ACS[4] AES Lynx[1] IBRRC	IBRRC[2,3,4]	IBRRC[5]	AES Lynx ACS
Whales, Porpoises, Seals and Sea Lions	AES Lynx[1]	AES Lynx[1]	ACS[4] AES Lynx[1] IBRRC	IBRRC[2,3,4]	IBRRC[5]	AES Lynx ACS
Terrestrial Mammals	AES Lynx[1] ABR[6] , LGL[6]	AES Lynx[1] ABR[6] , LGL[6]	ACS[4] AES Lynx[1] IBRRC	IBRRC[2,3,4]	IBRRC[5]	AES Lynx ACS
Endangered Species*	AES Lynx[1] ABR[6] , LGL[6]	AES Lynx[1] ABR[6] , LGL[6]	ACS[4] AES Lynx[1] IBRRC	IBRRC[2,3,4]	IBRRC	AES Lynx ACS

Notes:
1. The capability is available through AES Lynx, however, it requires enhancement to be response-ready. AES Lynx would contract for directly local hire directly or through other North Slope based corporations.
2. IBRRC is available through the ACS Master Services Agreement.
3. IBRRC would likely contract or sub-contract local experts or residents.
4. Village Response Teams are available through ACS Master Service Agreements to fill these roles.
5. This response action is likely restricted to young animals.
6. The capability of this contractor to perform these duties is assumed through other experience, not necessarily oil spill response.

*Endangered and threatened species are listed in Appendices 2 through 4 of the Alaska Regional Response Team (ARRT) Wildlife Protection Guidelines. Check at the time of the spill for current listing.

ACS = Alaska Clean Seas
AES Lynx = ASRC Energy Services, Lynx Enterprises, Inc.
ABR = ABR Inc. Environmental Research & Services
IBRRC = International Bird Rescue and Rehabilitation Center
LGL = LGL Limited

2.0 BACKGROUND INFORMATION

Marine mammal spill response options in the Arctic Ocean remain limited due to federal prohibitions and the practicality of capturing large animals for treatment. The Exxon Valdez incident provided the impetus for the development of a successful bird and sea otter capture and treatment program in the State of Alaska. Regulatory agencies have promoted a strong bird capture and treatment capability for North Slope operators.

Concerns over potential affects of drilling activities in the Beaufort Sea have lead to the seasonal drilling mitigation measures and restrictions in lease stipulations issued by the State of Alaska Division of Oil and Gas and the Minerals Management Service (MMS). MMS leases require lessees to enter into Conflict Avoidance Agreements with the AEWC before exploring for oil offshore. This includes the use of MMO during the seismic and drilling phases of an operation to address subsistence and whale harvest protection mitigation measures. The expectation of the AEWC is that the state stipulations along with the Conflict Avoidance Agreements required by the MMS would impose drilling restrictions during whale migration at varying times anywhere between June 1 and October 31, depending on the drilling location.

In recent years the focus has been to incorporate wildlife protection measures into facility design, implement wildlife monitoring and conflict avoidance programs, and develop response plans to contain and control oil spills at the source, thereby preventing the spread of oil and direct impacts to habitats and wildlife.

Response options such as hazing are available and can be effective for birds and certain terrestrial mammals. However, hazing large marine mammals is difficult and success has been mixed. Depending upon the species, wildlife conditioned to the human activity may not respond to hazing and the risk of oiling may be a lesser concern than the consequences of hazing, such as when seals abandon their pups. Due to these considerations, capture, treatment and rehabilitation need to be credible and sensitive to local concerns and knowledge.

Facilities exist in the State of Alaska to capture and stabilize oiled birds and marine mammals. On the North Slope, ACS maintains a Mobile Wildlife Stabilization Center and maintains a service agreement with the IBRRC.

3.0 PERMITS AND INFORMATION REQUIREMENTS

The permits required to are based on the jurisdiction and resource protection interests of each agency. See the attachment for a brief description of these responsibilities and interests. Each permit can be applied for during the response to the Unified Command, using the checklists and permit applications provided in Annex G of the Unified Plan. A copy of these applications and checklists has been enclosed.

The permit applications were developed by the ARRT for use by responsible parties during a spill event, if needed. The ARRT serves as a regional body for federal and state agencies to coordinate planning and preparedness activities in support of response operations for pollution incidents. For a detailed description of wildlife response planning requirements and options in Alaska, refer to the 176 pages of “Annex G – Wildlife Protection Guidelines” to the “Unified Plan”

for the State of Alaska, located at the Alaska Regional Response Team's website: http://www.akrrt.org/UnifiedPlan/index.shtml.

The Unified Command requires the following types of information to process the request: potentially affected species, estimated distribution, habitat types, spill trajectory, and hazing or treatment options. Qualified individuals to generate a "Wildlife Assessment" can be provided by the responsible party (RP) and/or agency personnel, at the discretion of the Federal on Scene Commander (FOSC).

The Wildlife Assessment is best performed by biological specialists and locals with traditional knowledge of the species affected, such as subsistence hunters. Federal agencies actively promote the involvement of local knowledge to come up with alternatives for wildlife rescue and protection. For example, Barrow residents played a major role in the planning for the rescue the grey whales in 1988.

The following table is taken from the ACS Technical Manual, Tactic W-1 and summarizes permits required for hazing, capture, and holding of live animals.

Table 2
State and Federal Permits and/or Authorizations Required for Hazing, Collecting, or Holding Live Animals

	Alaska Department of Fish and Game		U.S. Fish and Wildlife Service		National Marine Fisheries Service	
Species	**Collect and Hold**	**Haze**	**Collect and Hold**	**Haze**	**Collect and Hold**	**Haze**
Migratory Birds	No	Yes	Yes	No	No	No
Sea Otters, Walrus and Polar Bears	No	No	Yes	Yes	No	No
Whales, Porpoises, Seals and Sea Lions	No	No	No	No	Yes	Yes
Terrestrial Mammals	Yes	Yes	No	No	No	No
Endangered Species*	Yes	Yes	Yes	Yes	No	No

Source: App. 16 of the ARRT Wildlife Protection Guidelines, Alaska Unified Plan
*Endangered and threatened species are listed in Appendices 2 through 4 of the ARRT Wildlife Protection Guidelines. Check at the time of the spill for current listing.

4.0 ARCTIC OCEAN CONSIDERATIONS

Species identification is crucial to developing the wildlife assessment and response plans. The following species, separated into birds and mammals, are those likely to be encountered in the Arctic operating area:

4.1 MIGRATORY BIRDS

The major group to which each species belongs is indicated as follows: waterfowl (WF), seabird (SE), and other diving bird (DB), shorebird (SH), raptor (RA), and upland bird (UB). Also indicated are endangered species (ES), threatened species (TS), and those of special management concern (SMC) to the Alaska Department of Fish and Game (ADF&G). Species of SMC are generally defined as species established as a priority for study and management by public agencies to prevent their populations from declining to a level warranting a listing action under the Endangered Species Act.

Table 3
Migratory Birds

Species of Concern	Population Density Code	Species of Concern	Population Density Code
Loons (DB)	P/S	Scoter (WF)	U/S
Grebes (DB)	A	Mallard (WF)	R/S
Tundra Swans (WF)	P/S	Bald Eagles (RA)	A
Greater White-fronted Goose (WF)	P/S	Osprey (RA)(SMC)	A
Snow Goose (WF)	P/S	Arctic Peregrine Falcon (RA)	P
Emperor Goose (WF)	R/S	Snowy Owl (RA)	U/S
Black Brant (WF)	P/S	Sandhill Crane (SH)	U/S
Canada Geese (WF)	P/S	Wandering Tattler (SH)	A
Oldsquaw (WF)	P/S	Bristle-thighed Curlew (SH)(SMC)	R
Greater Scaup (WF)	U/S	American Golden Plover (SH)	P
Red-breasted Merganser (WF)	R/S	Semipalmated Plover (SH)	U
Northern Pintail (WF)	P/S	Aleutian Tern (SE)	A
Bufflehead (WF)	A	Arctic Tern (SE)	U
Goldeneye (WF)	A	Gulls (SE)	P/S
Canvasback (WF)	A	Murres (SE)	P/S
Northern Shoveler (WF)	R	Guillemots (SE)	U
Spectacled Eider (WF)(TS)	U/S	Murrelets (SE)	R
Steller's Eider (WF)(TS)	U/S	Kittlitz's Murrelet (SE)(SMC)	R
King Eider (WF)	P/S	Puffins (SE)	R
Common Eider (WF)	P/S	Northern Fulmar (SE)	R
Harlequin Duck (WF)(SMC)	R	Black-legged Kittiwake (SE)	P

Table 3
Migratory Birds

Species of Concern	Population Density Code	Species of Concern	Population Density Code
American Widgeon (WF)	U/S	Cormorants (SE)	R
Green-winged Teal (WF)	U/S	Ptarmigan (UB)	P/S
Wandering Tattler (SH)	A	Northern Shoveler (WF)	R
Bristle-thighed Curlew (SH)(SMC)	R	Spectacled Eider (WF)(TS)	U/S
American Golden Plover (SH)	P	Steller's Eider (WF)(TS)	U/S
Semipalmated Plover (SH)	U	King Eider (WF)	P/S
Aleutian Tern (SE)	A	Common Eider (WF)	P/S
Arctic Tern (SE)	U	Harlequin Duck (WF)(SMC)	R
Gulls (SE)	P/S	American Widgeon (WF)	U/S
Murres (SE)	P/S	Green-winged Teal (WF)	U/S
Guillemots (SE)	U	Scoter (WF)	U/S
Murrelets (SE)	R	Mallard (WF)	R/S
Kittlitz's Murrelet (SE)(SMC)	R	Bald Eagles (RA)	A
Puffins (SE)	R	Osprey (RA)(SMC)	A
Northern Fulmar (SE)	R	Arctic Peregrine Falcon (RA)	P
Black-legged Kittiwake (SE)	P	Snowy Owl (RA)	U/S
Cormorants (SE)	R	Sandhill Crane (SH)	U/S
Ptarmigan (UB)	P/S		

P = Present U = Uncommon R = Rare A = Casual/Accidental O = Pelagic (well offshore) S = Subsistence Species

4.2 MARINE MAMMALS

Table 4
Marine Mammals

Species of Concern	Population Density Code	Species of Concern	Population Density Code
Polar Bear (FWS)	P/S	Beluga Whale (NMFS)(SMC)	P/S
Ringed Seal (NMFS)	P/S	Brown Bear	P/S/SMC
Spotted Seal (NMFS)	P/S	Black Bear	P/S
Bearded Seal (NMFS)	P/S	Caribou/Reindeer	P/S
Pacific Walrus (FWS)	P/S	Moose	P/S
Ribbon Seal (NMFS)	P(pack ice)/S	Muskoxen	P/S/SMC
Bowhead Whale (NMFS)(ES)	P/S	Dall Sheep	P/S
Gray Whale (NMFS)	P	Wolf	P/S
Minke Whale (NMFS)	U	Arctic Fox	P/S
Aquatic Furbearers	P/S	Red Fox	P/S
Harbor Porpoise (NMFS)	P/S	Killer Whale (NMFS)	P

P = Present U = Uncommon R = Rare O = Pelagic (well offshore) S = Subsistence Species TS = Threatened Species ES = Endangered Species SMC = Special Management Concern

ATTACHMENT 1
AGENCY JURISDICTION/RESPONSIBILITIES

Under federal statutes, the National Marine Fisheries Service (NMFS, as an agency of the U.S. Department of Commerce (DOC)) has responsibility for managing and protecting all cetaceans and pinnipeds, except walruses. The Fish and Wildlife Service (FWS, as an agency of the U.S. Department of the Interior (DOI)) has responsibility for managing and protecting migratory birds, walruses, sea otters, and polar bears.

FWS has joint statutory responsibility with ADF&G for management of wildlife on all federal lands in Alaska (i.e., national park system units, national wildlife refuges, national forest system lands, military reservations, and other DOI- and federally-managed public lands).

DOC, through NMFS, is responsible for the administration of the Endangered Species Act as it applies to certain cetaceans (whales and porpoises) and pinnipeds (seals, sea lions, etc.) in Alaska. These include most species of whales and the northern (Steller) sea lion. DOI, through FWS, is responsible for the administration of the Endangered Species Act as it applies to remaining marine mammals and terrestrial mammal and bird species in Alaska. These species found in Alaska are as follows:

- Beluga Whales
- Bowhead Whales
- Humpback Whales
- Gray Whales
- Killer Whales (Orcas)
- Minke Whales
- Northern Right Whales

The Marine Mammal Protection Act (MMPA) of 1972 gave NMFS responsibility for the management and conservation of all but three species of marine mammals in Alaska. The USFWS, Region 7, Alaska, Marine Mammals Management Office is responsible for management of the three Alaska species: polar bears, sea otters, and Pacific walrus.

The hyperlink connects to the following resources:

- Wildlife Hazing, Capture and Treatment Facilities
- Oil Spill Hazing and Treatment Application Forms

Hyperlink: Facilities and Permit Applications.pdf

APPENDIX F:
PRODUCT SPECIFICATION FOR LOW SULFUR DIESEL FUEL OIL

MARKETING AND SUPPLY SALES SPECIFICATION
LOW SULPHUR DIESEL LIGHT

Effective: June 1, 2006
Location: Western Canada.

PARAMETER	MIN	MAX	TEST METHOD
Appearance	Clear and Bright		Visual
Ash, % mass		.010	ASTM D482
Colour	Report		ASTM D156, D1500
Distillation - 10% Recovered, °C		215.0	ASTM D86
Distillation - 90% Recovered, °C		290.0	ASTM D86
Density, kg/M3		850	ASTM D1298, D4052
Cetane Number	40.0		ASTM D613
Corrosion - Copper - 3 hrs @ 50°C		No. 1	ASTM D130
Electrical Conductivity, pS/m September 01 - April 15 @ 20°C April 16 - August 31@ 20°C	 200 (1) 100 (1)		ASTM D2624
Flash°C	40.0 (2)		ASTM D93, D3828
Lubricity	Meets Requirements		CAN/CGSB 3.517 Para 6.22
Mercaptan Sulphur, ppm		120	ASTM D3227
Micro Carbon Residue - 10 % Btms, % mass		0.10	ASTM D4530
Operability, °C	See Table A		ASTM D2500, D5773, CGSB 140.1
Pour Point, °C	Report		ASTM D97, D5949
Sulphur, mg/kg Up to Aug 31st, 2006 September 1, 2006		 500(3) 15(4)	ASTM D5453, D7039
Total Acid Number, mg/KOH/g		0.10	ASTM D974
Viscosity @ 40°C, cSt	1.30	3.00	ASTM D445
Water and Sediment, % vol		0.05	ASTM D1796(mod), D2709

TABLE A
CLOUD SCHEDULE (°C)

Terminal	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Vancouver	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34
Nanaimo	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34
Victoria	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34	-34
Kamloops	-37	-37	-34	-34	-34	-34	-34	-34	-34	-34	-34	-37
Prince George	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43
Terrace	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43
Calgary	-37	-37	-34	-34	-34	-34	-34	-34	-34	-34	-34	-37
Edmonton	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43
Regina	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43
Saskatoon	-43	-43	-34	-34	-34	-34	-34	-34	-34	-34	-43	-43
Winnipeg.	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43	-43
Hay River- Truck	-45	-44	-43	-43	-43	-43	-43	-43	-43	-43	-43	-45
Hay River-Marine	-48	-48	-48	-48	-48	-48	-48	-48	-48	-48	-48	-48
Whitehorse	-48	-48	-48	-48	-48	-48	-48	-48	-48	-48	-48	-48

Notes: (1) The fuel's minimum electrical conductivity shall apply at the shipping terminal.
(2) The fuel's minimum flash point shall be 43°C at the shipping terminal.
(3) The maximum sulphur will be 8 mg/kg at the refinery flange into pipeline, and 10 mg/kg into refinery connect rail & truck rack. Terminal storage will be converted to 12 mg/kg or less during the transition period of June through August.
(4) The maximum sulphur at the refinery "flange" will be 8 mg/kg into pipeline, and 10 mg/kg maximum into refinery connect rail or truck rack.

Meets: Automotive Low Sulphur Diesel Fuel, CAN/CGSB 3.517-2000 Type A-LS,
Regular Sulphur Diesel, CAN/CGSB-3.6-2000 Type A