



# **2018 ANNUAL NUNAVUT WATER BOARD REPORT FOR FOX-3 FOR THE North Warning System**

Contract # W8485-100224/001/NX  
SOW Ref: 16.F.5.d

Document Number  
FM-EHS-13, Rev 2, 5-Feb-2019

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## EXECUTIVE SUMMARY

This 2018 Annual Report for the Nunavut Water Board (NWB) has been prepared by Raytheon Canada Limited (RCL) for the Department of National Defence in order to meet the requirements of Part B "General Conditions", paragraph 1 of its licence. Water licence 3BC-FOD0919 was in effect from 01 January until it was replaced with licence 8BC-FOD1828 on 08 June 2018. This report covers 01 January to 31 December 2018.

RCL is the Operation and Maintenance (O&M) Contractor for the North Warning System (NWS) including FOX-3, the unattended (unmanned) North Warning System radar site at Dewar Lakes, Nunavut. The site is visited quarterly by RCL staff from FOX-M, Hall Beach, Nunavut for preventive maintenance inspections and as required for other work.

A total of 62.6 cubic meters was drawn from the water supply lake. This is below the annual maximum of 1,440 cubic meters allowed by the licence.

The water contained in the berms of fuel storage facilities was sent for laboratory analysis and confirmed to be within effluent quality limits of the NWB licence 3BC-FOD0919, Part D, item 10 before the water was pumped out of the berms.

As FOX-3 is a landlocked site, all Hazardous Waste and Waste Oil is transported to FOX-M before being shipped to an approved hazardous waste disposal site outside of Nunavut as required by the licence. The hazardous waste was shipped to Qikiqtaaluk Environmental, through their subcontractor Veolia, 2630, boul. Industriel, Chambly, QC J3L 4V2. A total of 3 crates and 18 drums of waste HAZMAT were shipped from FOX-3 in 2018.

Non-hazardous domestic solid waste was disposed of through a contract with the Hamlet of Hall Beach at the local landfill. RCL has documented authorization from the community for receiving the waste.

No unauthorized discharges to the environment at FOX-3 in 2018

The Spill Contingency Plan was updated on 29-Mar-2018.

Impacted soil from two spills, a pipeline leak in 2009 and a helicopter crash in 2013, was excavated and placed in a landfarm in 2018.



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## 1.0 INTRODUCTION

This 2018 Annual Report for the Nunavut Water Board (NWB) has been prepared by Raytheon Canada Limited (RCL) for the Department of National Defence in order to meet the requirements of Part B "General Conditions", paragraph 1 of its licence. Water licence 3BC-FOD0919 was in effect from 01 January until it was replaced with licence 8BC-FOD1828 on 08 June 2018. This report covers 01 January to 31 December 2018.

RCL is the Operation and Maintenance (O&M) Contractor for the North Warning System (NWS), including FOX-3. FOX-3 is an unattended (unmanned) North Warning System radar site located at Dewar Lakes, Nunavut. The site is visited quarterly by RCL staff from FOX-M, Hall Beach, Nunavut for preventive maintenance inspections and as required for other work.

### 1.1 Report Details

Licensee: Department of National Defence, Government of Canada  
Licence: 3BC-FOD0919 – Type "B" from 01-Jan-2018 until it was replaced on 08-Jun2018 with 8BC-FOD1828 – Type "B"  
Location: FOX-3 North Warning System Site, Dewar Lakes, Qikiqtani Region, Nunavut  
Report Prepared by: Raytheon Canada Limited, 05-Feb-2019  
Time period covered: 01 January to 31 December 2018

## 2.0 WATER USE

A total of 62.6 cubic meters (m<sup>3</sup>) was drawn from the water supply lake. This is below the annual maximum of 1,440 m<sup>3</sup> allowed by the licence. See Table 2-1 for the volume of raw water drawn at FOX-3 in 2018.

Table 2-1: Monthly Raw Water Usage at FOX-3 in 2018

Month	Raw water usage (m <sup>3</sup> )
January	0
February	0
March	0
April	0
May	0
June	45.8
July	0
August	0
September	16.8
October	0
November	0
December	0
<b>TOTAL</b>	<b>62.6</b>



### 3.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

As FOX-3 is a landlocked site, all Hazardous Waste and Waste Oil is transported to FOX-M before being shipped to an approved hazardous waste disposal site outside of Nunavut as required by the licence. The hazardous waste was shipped to Qikiqtaaluk Environmental, through their subcontractor Veolia, 2630, boul. Industriel, Chambly, QC J3L 4V2.

See Annex A for the shipping document including the completed movement documents for waste regulated under the Transportation of Dangerous Goods Regulations (TDGR) and NWS Manifests for non-regulated waste. A total of 3 crates and 18 drums of waste HAZMAT were shipped from FOX-3 in 2018.

**Table 3-1: Hazardous Waste and Waste Oil Sent for Disposal from FOX-3 in 2018**

Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste Jet A1 fuel filters	1 Drum	NWS Manifest TCN38388
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste oil filters	1 Drum	
Not TDG regulated		
Waste oil soaked sorbent	1 Drum	
Not TDG regulated		
Waste oil contaminated soil	1 Drum	
Not TDG regulated		
Waste oil	13 Drums	NWS Manifest TCN38388, TCN38304
Not TDG regulated		
Waste Jet A1 fuel and water mixture	1 Drum	NWS Manifest TCN38391
Waste fuel, aviation, turbine engine mixture		
Waste batteries, wet, filled with acid <sup>1</sup>	3 Crates	

### 4.0 NON-HAZARDOUS SOLID WASTE DISPOSAL

Non-hazardous domestic solid waste was disposed of through a contract with the Hamlet of Hall Beach at the local dump. RCL has documented authorization from the community for receiving the waste.

See **Table 4-1** for the quantity of waste generated.

The FOX-3 landfill still exists, but no new materials have been landfilled in the reporting period. See **Annex B** for the location of the landfill with co-ordinates.

<sup>1</sup> These waste batteries were stored at FOX-M in 2018. They will be sent for disposal from FOX-M in 2019.

**Table 4-1: Non-hazardous Domestic Solid Waste Sent for Disposal from FOX-3 in 2018**

Month	Waste Generated (kg)
January	0
February	113
March	0
April	238
May	78
June	0
July	2336
August	126
September	0
October	0
November	0
December	0
<b>TOTAL</b>	<b>2,891</b>

## 5.0 MONITORING PROGRAM

In 2018, a monitoring program was implemented at FOX-3 as required by the water licence, Part I. The monitoring program included the following:

1. Volume of raw water drawn from the water Supply Lake (FOD-1). The information from monitoring water use is shown in **Section 2.0 Water Use**. The water drawn was within the limit stated in the water licence.
2. Quality of sewage discharged from the final discharge point of the sewage disposal facility (FOD-2). The location of the sewage effluent outfall is shown in **Annex C**, including coordinates. A sump for the sewage outfall was constructed in 2010. The sewage outfall sump was sampled once in 2018. Monitoring Station FOD-2 was discontinued in water licence 8BC-FOD1828.

The results are shown in **Annex D: Analysis of Discharged Sewage Effluent**.

3. Quality of the water contained in the berms of fuel storage facilities prior to discharge (FOD-3) was analyzed and confirmed within the effluent quality limits listed in the water licence, Part D. The coordinates and the results of the analysis are shown in Annex E: Analysis of Berm Water. All samples met the effluent requirements of water licence 8BC-FOD1828, Part D.

## 6.0 SPILLS (UNAUTHORIZED DISCHARGES)

Date, NT-NU Spill #	Product	Quantity	Cause and follow-up action	On-site location
No unauthorized discharges to the environment at FOX-3 in 2018.				

## 7.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

The Spill Contingency Plan was updated on 29-Mar-2018. An updated copy of the Spill Contingency Plan was submitted to the NWB on 09-Jul-2018 in accordance with condition G2 to water licence 8BC-FOD1828. The Spill Contingency Plan was accepted by the NWB on 23-Jul-2018.



## 8.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

In December 2017, Canada assumed liability from the previous NWS O&M contractor for the spills resulting from a pipeline leak discovered in 2009 and a helicopter crash which occurred in 2013. Prior to that, pending resolution of this issue with the previous O&M contractor, Canada engaged the Environmental Sciences Group (ESG) in summer 2016 to complete a delineation of both spills and prepare an assessment report. The report indicates both spills combined represent approximately 438 m<sup>3</sup> of impacted soil requiring excavation and treatment.

In summer 2018, Canada procured the services of Defence Construction Canada (DCC) to contract an environmental engineering firm to excavate both spill areas and treat the impacted soil in a land farm on site. The contractor mobilized to the site in late August 2018 and successfully excavated, backfilled, and compacted the spill areas and landfarmed the impacted soil. Confirmatory sampling from September 2018 shows that further tilling of the land farm is required.

## 9.0 ACRONYMS

Table 9-1: Acronyms

Acronym	Definition
DCC	Defence Construction Canada
ESG	Environmental Sciences Group
FCSI	Federal Contaminated Sites Inventory
n.o.s.	Not Otherwise Specified
NWB	Nunavut Water Board
NWS	North Warning System
O&M	Operations and Maintenance
PCB	Polychlorinated Biphenyl
RCL	Raytheon Canada Limited
TDGR	Transportation of Dangerous Goods Regulations





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## ANNEX A: HAZARDOUS WASTE AND WASTE OIL DISPOSAL IN 2018

The 2018 Movement Documents for TDG Regulated waste and NWS Manifests for non-TDG Regulated waste described in Table 3-1 are below.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS DECLARATION DE L'EXPÉDITEUR POUR MARCHANDISES DANGEREUSES						
<b>Shipper</b> Expéditeur RAYTHEON NWS LRR DEWAR LAKES NU		<b>Air Waybill No.</b> No de L.T.A.  <b>Page</b> 1 <b>of</b> 1 <b>Pages</b> <b>Page</b> 1 <b>de</b> 1 <b>pages</b> <b>Shipper's Reference Number (optional)</b> N° de référence de l'expéditeur (facultatif) 7CN-11898				
<b>Consignee</b> Destinataire RAYTHEON NWS LSS NALL BEACH NU						
<p>Two completed and signed copies of this Declaration must be handed to the operator. Deux copies de cette déclaration dûment remplies et signées doivent être remises à l'exploitant.</p> <p><b>TRANSPORT DETAILS</b> RENSEIGNEMENTS SUR LE TRANSPORT</p> <p>This shipment is within the limitations prescribed for: (delete non-applicable) Cette expédition est dans les limites autorisées pour: (biffer la mention inutile)</p> <p><input checked="" type="checkbox"/> PASSENGER AND CARGO AIRCRAFT AÉROFRET PASSAGERS ET CARGO</p> <p><input checked="" type="checkbox"/> CARGO AIRCRAFT AÉROFRET CARGO SEULEMENT</p> <p><b>Airport of Departure:</b> Aéroport de départ: DEWAR LAKES</p> <p><b>Airport of Destination:</b> Aéroport de destination: NALL BEACH.</p> <p><b>Shipment type: (delete non-applicable)</b> <input checked="" type="checkbox"/> NON-RADIOACTIVE <b>Type d'envoi: (biffer la mention inutile)</b> <input checked="" type="checkbox"/> NON-RADIOACTIF</p>						
<b>WARNING</b> Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.						
<b>AVERTISSEMENT</b> Le non-respect sur quelque point que ce soit de la Réglementation sur le transport des marchandises dangereuses peut constituer une infraction aux lois en vigueur, punissable par la loi.						
<b>NATURE AND QUANTITY OF DANGEROUS GOODS / NATURE ET QUANTITÉ DE MARCHANDISES DANGEREUSES</b>						
<b>Dangerous Goods Identification / Identification des marchandises dangereuses</b>						
UN or ID No. N° UN ou ID	Proper Shipping Name Désignation exacte d'expédition	Class or Division (Subsidiary Risk) Classe ou division (risque subsidiaire)	Packing Group Groupe d'emballage	Quantity and type of packing Quantité et type d'emballage	Packing Inst. Instructions d'emballage	Authorization Autorisation
UN 3175	WASTE SOLIDS CONTAINING FLAMMABLE LIQUID N.O.S (FUEL, AVIATION TURBINE ENGINE)	4.1	II	1 STEEL DRUM X 50 kg	448	
UN 1863	WASTE * FUEL, AVIATION TURBINE ENGINE	3	III	1 STEEL DRUM X 120 L	355	
<b>Additional Handling Information/ Renseignements complémentaires concernant la manutention</b> * FLASH POINT 38°C						
<b>For emergency contact: 24-hour No.:</b> <b>Pour urgence: Numéro 24 heures:</b> CONTACT EMERGENCY 24 HR CANUTEC 1613 996-6666						
<p>I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.</p> <p>Par la présente, je déclare que les renseignements relatifs à la description du contenu du chargement et à la désignation exacte d'expédition du produit expédié sont complets et exacts; et que le contenu est correctement classé, emballé, identifié, étiqueté/placardé et qu'il est conforme à tous égards aux règlements gouvernementaux, nationaux et internationaux en matière de transport.</p> <p>Je déclare que toutes les prescriptions requises pour le transport aérien ont été respectées.</p>				<p><b>Name/Title of Signatory / Nom/Titre du Signataire</b> RON DUBEAU SHIPPER</p> <p><b>Place and Date / Lieu et Date</b> DEWAR LAKES 01-JULY-2018</p> <p><b>Signature</b> (See warning above) (Voir avertissement ci-dessus)</p>		

Figure 1: Shipper's Declaration for Dangerous Goods removed from FOX-3

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SHIPPER'S DECLARATION FOR DANGEROUS GOODS DÉCLARATION DE L'EXPÉDITEUR POUR MARCHANDISES DANGEREUSES								
<b>Shipper</b> Expéditeur RAYTHEON NWS LRR DEWAR LAKES NU			<b>Air Waybill No.</b> No de L.T.A.  <b>Page</b> 1 <b>of</b> 1 <b>Pages</b> Page 1 <b>de</b> 1 <b>pages</b> <b>Shipper's Reference Number (optional)</b> N° de référence de l'expéditeur (facultatif) TCN-11878					
<b>Consignee</b> Destinataire RAYTHEON NWS LSS HALL BEACH NU								
<small>Two completed and signed copies of this Declaration must be handed to the operator. Deux copies de cette déclaration dûment remplies et signées doivent être remises à l'exploitant.</small>								
<b>TRANSPORT DETAILS</b> RENSEIGNEMENTS SUR LE TRANSPORT <small>This shipment is within the limitations prescribed for: (delete non-applicable) Cette expédition est dans les limites autorisées pour: (biffer la mention inutile)</small> <table border="1"><tr><td>PASSENGER AND CARGO AIRCRAFT AÉROPLANE PASSAGERS ET CARGO</td><td>CANADA AIRCRAFT AÉROPLANE CANADIEN SEULEMENT</td></tr></table>			PASSENGER AND CARGO AIRCRAFT AÉROPLANE PASSAGERS ET CARGO	CANADA AIRCRAFT AÉROPLANE CANADIEN SEULEMENT	<b>Airport of Departure:</b> Aéroport de départ: DEWAR LAKES			
PASSENGER AND CARGO AIRCRAFT AÉROPLANE PASSAGERS ET CARGO	CANADA AIRCRAFT AÉROPLANE CANADIEN SEULEMENT							
<b>Airport of Destination:</b> Aéroport de destination: HALL BEACH			<b>Shipment type: (delete non-applicable)</b> Type d'envoi: (biffer la mention inutile) <table border="1"><tr><td>NON-RADIOACTIVE NON-RADIOACTIF</td><td><del>RADIOACTIVE</del> <del>RADIOACTIF</del></td></tr></table>				NON-RADIOACTIVE NON-RADIOACTIF	<del>RADIOACTIVE</del> <del>RADIOACTIF</del>
NON-RADIOACTIVE NON-RADIOACTIF	<del>RADIOACTIVE</del> <del>RADIOACTIF</del>							
<b>NATURE AND QUANTITY OF DANGEROUS GOODS / NATURE ET QUANTITÉ DE MARCHANDISES DANGEREUSES</b>								
<b>Dangerous Goods Identification / Identification des marchandises dangereuses</b>								
UN or ID No. N° UN ou ID	Proper Shipping Name Désignation exacte d'expédition	Class or Division (Subsidiary Risk) Classe ou division (risque subsidiaire)	Packing Group Groupe d'emballage	Quantity and type of packing Quantité et type d'emballage	Packing Inst. Instructions d'emballage	Authorization Autorisation		
4N 1013	CARBON DIOXIDE	2.2		11 CYLINDER X 75 kg	200			
4N 1044	FIRE EXTINGUISHERS	2.2		1 WOOD CRATE X 75 kg	213			
4N 2794	WASTE BATTERIES, WET KILLED WITH ACID	8		3 WOOD CRATE X 401 kg	870			
<b>Additional Handling Information/ Renseignements complémentaires concernant la manutention</b>								
<b>For emergency contact: 24-hour No.:</b> <b>Pour urgence: Numéro 24 heures:</b> CONTACT EMERGENCY 24 HR CANUTEC 1613 996-6666								
<small>I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met. Par la présente, je déclare que les renseignements relatifs à la description du contenu du chargement et à la désignation exacte d'expédition du produit expédié sont complets et exacts; et que le contenu est correctement classé, emballé, identifié, étiqueté/placardé et qu'il est conforme à tous égards aux règlements gouvernementaux, nationaux et internationaux en matière de transport. Je déclare que toutes les prescriptions requises pour le transport aérien ont été respectées.</small>				<b>Name/Title of Signatory / Nom/Titre du Signataire</b> RON DUBEAU SHIPPER  <b>Place and Date / Lieu et Date</b> DEWAR LAKES 01-JULY-2018  <b>Signature</b> (See warning above) <i>[Signature]</i> (Voir avertissement ci-dessus)				

Figure 2: Shipper's Declaration for Dangerous Goods removed from FOX-3

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## SHIPPING MANIFEST

Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8

NON NEGOTIABLE

<b>Filled By:</b> RDUBEAU		<b>Date:</b> Jul 26, 2018, 4:38 PM		<b>TCN-38388</b>			
<b>Ship To:</b> LSS-F/FOX-M, HALL BEACH, DND Storeroom  Raytheon Canada Limited, LSS Hall Beach: P.O. Box 46  Hall Beach, NU, X0A 0K0  867-928-8987			<b>From:</b> FOX-3, DEWAR LAKES, DND Storeroom Raytheon Canada Limited, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987		<b>Priority</b>  <b>1</b>		
<b>Attention:</b>			<b>Attention:</b>				
<b>Carrier:</b>		<b>Routing:</b> YUW/YUX		<b>Waybill #:</b>	<b>Total Pcs.</b> 11 PCS		
				<b>Total Weight:</b> 14,500 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	WOOD CRATE	800 LBS	4002748	WASTE-DRY MATERIAL-NON CONTROL	F318-20		L 72" X W 48" X H 57"
1	PALLET	1100 LBS	2002406	WASTE - OIL, 45 GAL	F318-9		L 56" X W 30" X H 45" ASSETS 347764,347830
1	PALLET	1200 LBS	2002356	WASTE - OIL FILTERS	F318-7		L 54" X W 54" X H 44" ASSET 344585
1	PALLET		3006639	WASTE - OIL SOAKED ABSORBENT	F318-7		ASSET 344584
1	PALLET		2008310	WASTE - OIL CONTAMINATED SOIL	F318-7		ASSET 370876
1	PALLET		2003635	WASTE - FUEL FILTERS (DRUM)	F318-7		ASSET 343297 (UN 3175)
1	WOOD CRATE	1100 LBS	4002749	WASTE-UNTREATED WOOD	F318-22		L 72" X W 48" X H 55"
1	WOOD CRATE	1100 LBS	4002749	WASTE-UNTREATED WOOD	F318-22		L 96" X W 50" X H 57"
1	STEEL TANK	2000 LBS			F318-23		STAINLESS STEEL WATER TANK   125" X W 88" X H 45"
1	PALLET	700 LBS	1065511	LUMBER,4" WD,8' LG,2" THK,SOFT	F318-24		L 96" X W 36" X H 21"
1	PALLET	2200 LBS	1018694	BUCKET,SNOW & ICE,3.5 CU YD,LO	F318-25		S/N. 9625 L 104" X W 64" X H 56"
1	PALLET	2200 LBS	1018694	BUCKET,SNOW & ICE,3.5 CU YD,LO	F318-26		S/N. 8351 L 104" X W 64" X H 56"
1	PALLET	2100 LBS	1018696	BUCKET,ROCK,2.25 CU YD,LOADER	F318-27		S/N. 10237 L 101" X W 51" X H 52"
<b>NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.</b>						<b>Received By:</b>	
						<b>Date</b>	
						<b>Received By:</b>	
						<b>Date</b>	

Figure 3: NWS Shipping Manifest TCN-39388

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## SHIPPING MANIFEST

Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8

NON NEGOTIABLE

<b>Filled By:</b> RDUBEAU		<b>Date:</b> Jul 10, 2018, 1:43 PM		<b>TCN-38304</b>			
<b>Ship To:</b> LSS-F/FOX-M, HALL BEACH, DND Storeroom  Raytheon Canada Limited, LSS Hall Beach: P.O. Box 46  Hall Beach, NU, X0A 0K0  867-928-8987			<b>From:</b> FOX-3, DEWAR LAKES, DND Storeroom Raytheon Canada Limited, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987		<b>Priority</b>  <b>2</b>		
<b>Attention:</b>			<b>Attention:</b>				
<b>Carrier:</b>		<b>Routing:</b> YUW/YUX		<b>Waybill #:</b>	<b>Total Pcs.</b> 11 PCS		
				<b>Total Weight:</b> 11,622 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	CRATE	500 LBS	4002748	WASTE-DRY MATERIAL-NON CONTROL	F318-1		L 72" X W 48" X H 57"
1	CRATE	450 LBS	4002748	WASTE-DRY MATERIAL-NON CONTROL	F318-2		L 72" X W 48" X H 57"
1	CRATE	500 LBS	4002748	WASTE-DRY MATERIAL-NON CONTROL	F318-3		L 72" X W 48" X H 57"
1	CRATE	700 LBS	4002748	WASTE-DRY MATERIAL-NON CONTROL	F318-4		L 72" X W 48" X H 57"
1	CRATE	1900 LBS	1082018	SHORT BLOCK GROUP; U/O CATERPI	F318-15		L 72" X W 48" X H 57"
1	CRATE	1900 LBS	1082018	SHORT BLOCK GROUP; U/O CATERPI	F318-16		L 72" X W 48" X H 57"
1	CRATE	822 LBS	2001823	HEAD,CYLINDER,CORE EXCHANGE	F318-17		L 50" X W 40" X H 17" TWO CRATED HEADS ON PALLET
1	PALLET	1800 LBS	2002406	WASTE - OIL, 45 GAL	F318-5		L 48" X W 48" X H 43" ASSETS 347762,339989,345519,347760
1	PALLET	1800 LBS	2002406	WASTE - OIL, 45 GAL	F318-6		L 48" X W 48" X H 43" ASSETS 347761,347763,347765,347829
1	PALLET	900 LBS	2002406	WASTE - OIL, 45 GAL	F318-8		L 48" X W 24" X H 43" ASSETS 345521,345520
1	PALLET	350 LBS	2002406	WASTE - OIL, 45 GAL	F318-19		L 36" X W 24" X H 40" ASSET 347831
<b>NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.</b>						<b>Received By:</b>	<b>Date</b>
						<b>Received By:</b>	<b>Date</b>

Figure 4: NWS Shipping Manifest TCN-38304

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## SHIPPING MANIFEST

Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8

NON NEGOTIABLE

<b>Filled By:</b> RDUBEAU		<b>Date:</b> Jul 27, 2018, 10:58 AM		<b>TCN-38391</b>			
<b>Ship To:</b> LSS-F/FOX-M, HALL BEACH, DND Storeroom  Raytheon Canada Limited, LSS Hall Beach: P.O. Box 46  Hall Beach, NU, X0A 0K0  867-928-8987			<b>From:</b> FOX-3, DEWAR LAKES, DND Storeroom Raytheon Canada Limited, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987		<b>Priority</b>  <b>1</b>		
<b>Attention:</b>		<b>Attention:</b>					
<b>Carrier:</b>		<b>Routing:</b> YUW/YUX		<b>Waybill #:</b>	<b>Total Pcs.</b> 6 PCS		
				<b>Total Weight:</b> 6196 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	PALLET	150 LBS	2006405	WASTE - FUEL AND WATER MIXTURE	F318-11		ASSET 344580 ( UN 1863) L 38" X W 24" H 41"
1	WOOD CRATE	2900 LBS	2007535	GAS, 100 LB CYL, CO2, PYRENE 9	F318-18		L 50" X W 42" X H 72" (UN 1013) ASSET 160837,160838,,160835,117580
1	WOOD CRATE	500 LBS			F318-14		EXTINGUISHER FIRE (UN 1044) L 50" X W 49" X H 35"
1	WOOD CRATE	820 LBS	2002347	WASTE - BATTERIES, WET, FILLED	F318-10		(UN 2794) L 48" X W 40" X H 42"
1	WOOD PALLET	830 LBS	2002347	WASTE - BATTERIES, WET, FILLED	F318-12		(UN 2794) L 49" X W 22" X H 20"
1	WOOD CRATE	1000 LBS	2002347	WASTE - BATTERIES, WET, FILLED	F318-14		(UN 2794) L 52" X W 52" X H 19"
<b>NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.</b>						<b>Received By:</b>	
						<b>Date</b>	
						<b>Received By:</b>	
						<b>Date</b>	

Figure 5: NWS Shipping Manifest TCN-38391

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## ANNEX B: LOCATION OF LANDFILL WITH COORDINATES



Coordinates of landfill: 68° 39' 1.50"N, 71° 14' 35.00"W



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## ANNEX C: SEWAGE EFFLUENT OUTFALL (FOD-2) LOCATION WITH COORDINATES



Coordinates of Sewage Outfall Location (FOD-2): 68° 39' 6.38"N, 71° 14' 6.44"W

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## ANNEX D: ANALYSIS OF DISCHARGED SEWAGE EFFLUENT

The sewage outfall sump was sampled on 03-Aug-2018. The sample was analysed for the parameters listed in water licence 3BC-FOD0919 Part I, Item 3. Monitoring Station FOD-2 was discontinued in water licence 8BC-FOD1828.

Table D-1: Summary of Analysis of Discharged Sewage Effluent at FOX-3 in 2018

Sample Date	Parameter				
	pH	Oil and Grease (Present - P / Absent - A)	Biological Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	Faecal Coliforms
3-Aug-18	7.98	A	213	374	180



Environment Testing

### Certificate of Analysis

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 002160-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1814289  
Date Submitted: 2018-08-13  
Date Reported: 2018-08-20  
Project:  
COC #: 188711

Group		Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry		BOD5	1	mg/L		1380108 WW
		pH	1.00			2018-08-03 FOX-3 Sewage Seep
		Total Suspended Solids	2	mg/L		
Oil and Grease		Oil & Grease - Mineral	1	mg/L		
		Oil & Grease - Non-mineral	1	mg/L		
		Oil & Grease - Total	1	mg/L		
		Visible Sheen		P/A		

Guideline = \* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.  
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Figure 6: 03-Aug-2018 sewage effluent results, Page 1 of 2





**Environment Testing**

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 002160-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1814296  
Date Submitted: 2018-08-13  
Date Reported: 2018-08-14  
Project:  
COC #: 188711

				Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	
Group	Analyte	MRL	Units	Guideline	
Others	Faecal Coliforms	0	ct/100mL		1380134 WW - 2018-08-03 FOX-3 Sample Seepage  180

Figure 7: 03-Aug-2018 sewage effluent results, Page 2 of 2

**ANNEX E: ANALYSIS OF BERM WATER<sup>2</sup>**

The berm water was sampled on 28-Jun-2018. The sample was analysed for the parameters listed in water licence 8BC-FOD1828 Part D, Item 12.

**Table E-1: Analysis of Berm Water at FOX-3 in 2018**

<b>Berm</b>	<b>Maximum concentration of any grab sample (ug/L)</b>	<b>DEW W22A&amp;B</b>	<b>DEW W22C&amp;D</b>	<b>DEW W20D&amp;E</b>
<b>Location on-site</b>		Summit	Summit	Airstrip
<b>Discharge Latitude<sup>3</sup></b>		68°39'5.43"N	68°39'3.67"N	68°37'24.90"N
<b>Discharge Longitude</b>		71°14'3.23"W	71°13'49.97"W	71° 8'5.62"W
<b>Date</b>		28-Jun-18	28-Jun-18	28-Jun-18
Oil and Grease (ug/L)	5000	1000	<1000	1000
Benzene (ug/L)	370	<0.5	<0.5	<0.5
Toluene (ug/L)	2	<0.5	<0.5	<0.5
Ethyl benzene (ug/L)	90	<0.5	<0.5	<0.5

<sup>2</sup> Effluent from bermed fuel storage facilities.

<sup>3</sup> Final discharge point of bermed fuel storage facility



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Environment Testing

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 17-00919  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1812364  
Date Submitted: 2018-07-16  
Date Reported: 2018-07-23  
Project:  
COC #: 833821

		Lab I.D.		Sample Matrix	
		Sample Type		Sampling Date	
		Sample I.D.			
Group	Analyte	MRL	Units	Guideline	
Oil and Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		1
	Oil & Grease - Total	1	mg/L		1
VOCs Surrogates	Toluene-d8	0	%		92
Volatiles	Benzene	0.5	ug/L		<0.5
	Ethylbenzene	0.5	ug/L		<0.5
	m/p-xylene	0.4	ug/L		<0.4
	o-xylene	0.4	ug/L		<0.4
	Toluene	0.5	ug/L		<0.5

Guideline =

\* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.  
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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Figure 8: DEW W22A&B berm water laboratory results

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Environment Testing

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 17-00919  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1812363  
Date Submitted: 2018-07-16  
Date Reported: 2018-07-23  
Project:  
COC #: 833820

Group		Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Oil and Grease		Oil & Grease - Mineral	1	mg/L		1374146 Water
		Oil & Grease - Non-mineral	1	mg/L		2018-06-28 F3-W22 C D
		Oil & Grease - Total	1	mg/L		
VOCs Surrogates		Toluene-d8	0	%		
Volatiles		Benzene	0.5	ug/L		<1
		Ethylbenzene	0.5	ug/L		<1
		m/p-xylene	0.4	ug/L		<0.5
		o-xylene	0.4	ug/L		<0.5
		Toluene	0.5	ug/L		<0.5

Guideline = \* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.  
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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Page 2 of 3

**Figure 9: DEW W22C&D berm water laboratory results**

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SOW Ref: 16.F.5.d



**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 002160-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1812815  
Date Submitted: 2018-07-23  
Date Reported: 2018-07-30  
Project:  
COC #: 834018

		Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
			1375580	Water		
Group	Analyte	MRL	Units	Guideline		
Oil and Grease	Oil & Grease - Mineral	1	mg/L			1
	Oil & Grease - Non-mineral	1	mg/L			<1
	Oil & Grease - Total	1	mg/L			1
VOCs Surrogates	Toluene-d8	0	%			95
Volatiles	Benzene	0.5	ug/L			<0.5
	Ethylbenzene	0.5	ug/L			<0.5
	m/p-xylene	0.4	ug/L			<0.4
	o-xylene	0.4	ug/L			<0.4
	Toluene	0.5	ug/L			<0.5

Guideline = \* = Guideline Exceedence

Results relate only to the parameters tested on the samples submitted.  
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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**Figure 10: DEW W20D&E berm water laboratory results**

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