



# 2019 ANNUAL NUNAVUT WATER BOARD REPORT FOR FOX-3 FOR THE North Warning System

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

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## EXECUTIVE SUMMARY

This 2019 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 the licence issued 08 June 2018, 8BC-FOD1828 – Type “B”, Part B “General Conditions”, paragraph 1 of its licence. This report covers 01 January to 31 December 2019.

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 182.8 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 8BC-FOD1828, Part D, item 12 before the water was pumped out of the berms.

As FOX-3 is a landlocked site, all hazardous waste, including 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 2 crates and 10 drums of waste HAZMAT were shipped from FOX-3 in 2019.

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.

There were no unauthorized discharges to the environment at FOX-3 in 2019.

The Spill Contingency Plan was updated on 29-Mar-2019.

No progressive reclamation work was undertaken in 2019, but DND shall have the land farm sampled in summer 2020 and have further tilling performed if required.



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## 1.0 INTRODUCTION

This 2019 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 the licence issued 08 June 2018, 8BC-FOD1828 – Type “B”, Part B “General Conditions”, paragraph 1 of its licence. This report covers 01 January to 31 December 2019.

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: 8BC-FOD1828 – Type “B”  
 Location: FOX-3 North Warning System Site, Dewar Lakes, Qikiqtani Region, Nunavut  
 Report Prepared by: Raytheon Canada Limited, 20-Mar-2020  
 Time period covered: 01 January to 31 December 2019

## 2.0 WATER USE

A total of 182.8 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 water drawn at FOX-3 each month in 2019.

Table 2-1: Monthly Raw Water Usage at FOX-3 in 2019

Month	Raw water usage (m <sup>3</sup> )
January	0
February	0
March	0
April	0
May	17.2
June	0
July	61.8
August	0
September	103.8
October	0
November	0
December	0
<b>TOTAL</b>	<b>182.8</b>



### 3.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

As FOX-3 is a landlocked site, all hazardous waste, including 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 2 crates and 10 drums of waste HAZMAT were shipped from FOX-3 in 2019.

**Table 3-1: Hazardous Waste and Waste Oil Sent for Disposal from FOX-3 in 2019**

Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste tank bottom water/ tank cleaning effluent	3 Drums	NWS Manifest TCN39707
Waste fuel, aviation, turbine engine mixture		
Waste Jet A1 fuel soaked sorbent	2 Drums	NWS Manifest TCN39707
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste batteries, wet, non-spillable	1 Crate	NWS Manifest TCN39707
Waste oil	2 Drums	NWS Manifest TCN39707
Not TDG regulated		
Waste Jet A1 fuel	1 Drum	NWS Manifest TCN39707
Waste fuel, aviation, turbine engine		
Waste Fire Extinguisher	1 Crate	NWS Manifest TCN39707
Waste sewage sludge	2 Drums	NWS Manifest TCN39707
Not Regulated		
Carbon Dioxide	1 Crate	NWS Manifest TCN39710

### 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: Location of Landfill with Coordinates** for its location on-site.



**Table 4-1: Non-hazardous Domestic Solid Waste Sent for Disposal from FOX-3 in 2019**

Month	Waste Generated (kg)
January	0
February	0
March	0
April	0
May	0
June	295
July	3447
August	0
September	0
October	0
November	0
December	0
<b>TOTAL</b>	<b>3,742</b>

## 5.0 MONITORING PROGRAM

In 2019, 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: Sewage Effluent Outfall (FOD-2) Location with Coordinates**. A sump for the sewage outfall was constructed in 2010. The sewage outfall sump was sampled once in 2019. The results are shown in **Annex D: Analysis of Discharged Sewage Effluent**.

Monitoring Station FOD-2 was discontinued in water licence 8BC-FOD1828.

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.
4. Final Discharge Point from the Landfarm (FOD-4). No samples were taken in 2019.

## 6.0 SPILLS (UNAUTHORIZED DISCHARGES)

There were no unauthorized discharges (spills) at FOX-3 in 2019.

## 7.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

The Spill Contingency Plan was updated on 29-Mar-2019. An updated copy of the Spill Contingency Plan has been submitted to the NWB with this annual report.

## 8.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

No progressive reclamation work was undertaken at this site in 2019.



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 that occurred in 2013.

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 showed that further tilling of the land farm is required.

DND shall have the land farm sampled in summer 2020 and have further tilling performed if required. The goal is to reach the Canadian Council of Ministers of the Environment (CCME) Soil Quality Guidelines (SQG) and the CCME Canada-wide Standard for Petroleum Hydrocarbons (PHC CWS) criteria for hydrocarbon remediation and decommission the land farm by the end of summer 2020.

## 9.0 ACRONYMS

Table 9-1: Acronyms

Acronym	Definition
CCME	Canadian Council of Ministers of the Environment
CWS for PHC	Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil
DCC	Defence Construction Canada
DND	Department of National Defence
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
SQG	Soil Quality Guidelines
TDGR	Transportation of Dangerous Goods Regulations



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**ANNEX A: HAZARDOUS WASTE AND WASTE OIL DISPOSAL IN 2019**

The 2019 Movement Documents for TDG Regulated waste and NWS Manifests for non-TDG Regulated waste described in Table 3-1 are below.

<b>Shipper</b> RAYTHEON CANADA LTD <b>Expéditeur</b> NWS LRR DEWAR LAKES		Air Waybill No. <u>28067362</u> No de L.T.A.				
		Page <u>1</u> of <u>1</u> Pages Page <u>de 1</u> de <u>1</u> pages				
		Shipper's Reference Number (optional) TCN-39710 N° de référence de l'expéditeur (facultatif)				
<b>Consignee</b> RAYTHEON CANADA LTD <b>Destinataire</b> NWS LSS HALL BEACH						
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.		<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>TRANSPORT DETAILS</b> <b>RENSEIGNEMENTS SUR LE TRANSPORT</b> This shipment is within the limitations prescribed for: (delete non-applicable) Cette expédition est dans les limites autorisées pour: (biffer la mention inutile)		<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.				
Airport of Departure: Aéroport de départ: <b>DEWAR LAKES</b>		Shipment type: (delete non-applicable) Type d'envoi: (biffer la mention inutile) <input type="checkbox"/> NON-RADIOACTIVE / NON-RADIOACTIF <input checked="" type="checkbox"/> <del>HAZARDOUS</del> / <del>DANGEREUX</del>				
Airport of Destination: Aéroport de destination: <b>HALL BEACH</b>						
<b>NATURE AND QUANTITY OF DANGEROUS GOODS / NATURE ET QUANTITÉ DE MARCHANDISES DANGEREUSES</b>						
Dangerous Goods Identification / Identification des marchandises dangereuses						
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 1013	CARBON DIOXIDE	2.2		1 WOOD CRATE X 375 KG Net Qty	200	
UN 1072	OXYGEN COMPRESSED	2.2 (5.1)		1 WOOD CRATE X 0.001 KG Net Qty  (OVERPACK)	200	
Additional Handling Information/ Renseignements complémentaires concernant la manutention						
For emergency contact: 24-hour No.: Pour urgence: Numéro 24 heures: <b>24-HOUR EMERGENCY NUMBER CANUTEC 1(613) 996-6666</b>						
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. 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 applicables pour le transport aérien ont été respectées.				Name/Title of Signatory / Nom/Titre du Signataire <b>Ron Dubeau Warehouse Person</b>  Place and Date / Lieu et Date <b>Dewar Lakes 21-June-2019</b> Signature <i>Ron Dubeau</i> <small>(See warning above) (Voir avertissement ci-dessus)</small>		

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**

Shipper / Expéditeur: RAYTHEON CANADA LTD / NWS LRR DEWAR LAKES  
 Air Waybill No. / No de L.T.A.: 28067362  
 Page / Page: 1 of 1 / de 1 pages  
 Shipper's Reference Number (optional) / N° de référence de l'expéditeur (facultatif):

Consignee / Destinataire: RAYTHEON CANADA LTD / NWS LSS HALL BEACH

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.

**TRANSPORT DETAILS / RENSEIGNEMENTS SUR LE TRANSPORT**  
 This shipment is within the limitations prescribed for: (delete non-applicable) / Cette expédition est dans les limites autorisées pour: (biffer la mention inutile)  
 Airport of Departure: / Aéroport de départ: DEWAR LAKES  
 Airport of Destination: / Aéroport de destination: HALL BEACH

**WARNING / AVERTISSEMENT**  
 Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties. / 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.

Shipment type: (delete non-applicable) / Type d'envoi: (biffer la mention inutile)  
 NON-RADIOACTIVE / NON-RADIOACTIF

**NATURE AND QUANTITY OF DANGEROUS GOODS / NATURE ET QUANTITÉ DE MARCHANDISES DANGEREUSES**

Dangerous Goods Identification / Identification des marchandises dangereuses						
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
UN 1863	WASTE, FUEL, AVIATION, TURBINE, ENGINE, MIXTURE	3	III	3 STEEL DRUM X 205 L Net Qty	355	
UN 1863	WASTE, FUEL, AVIATION, TURBINE, ENGINE	3	III	1 STEEL DRUM X 205 L Net Qty	355	
UN 3175	WASTE, SOLIDS CONTAINING FLAMMABLE LIQUID N.O.S (FUEL AVIATION TURBINE ENGINE)	4.1	II	2 STEEL DRUM X 15 KG Net Qty	445	
UN 2800	WASTE BATTERIES WET NON-SPILLABLE	8		1 WOOD CRATE X 427 KG Gross Qty	872	
UN 1044	WASTE FIRE EXTINGUISHERS	2.2		1 WOOD CRATE X 272 KG Net Qty	213	

Additional Handling Information / Renseignements complémentaires concernant la manutention

For emergency contact: 24-hour No.: / Pour urgence: Numéro 24 heures: 24-Hour Emergency Contact Number Canutec 1(613) 996-6666

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. / 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.

Name/Title of Signatory / Nom/Titre du Signataire: Ron Dubeau Warehouse Person  
 Place and Date / Lieu et Date: Dewar Lakes 21-June 2019  
 Signature: [Signature]

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>Filed By:</b> RDUBEAU	<b>Date:</b> Jun 19, 2019, 8:57 AM	<b>TCN-39707</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> 8 PCS
	<b>Total Weight:</b> 8170 LBS

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	CRATE	1200 LBS	1060675	EXTINGUISHER,FIRE,DRY CHEMICAL	F3019-15		WASTE FIRE EXTINGUISHERS (UN 1044) L 72" X W 48" X H 54"
1	PALLET	1200 LBS	4003110	WASTE - SEWAGE SLUDGE (HAZMAT)	F3019-18		SEWAGE SLUDGE (NON-REGULATED) L 48" X W 36" X H 45"
1	PALLET	1000 LBS	4003110	WASTE - SEWAGE SLUDGE (HAZMAT)	F3019-19		SEWAGE SLUDGE (NON-REGULATED) L 48" X W 40" X H 45"
1	PALLET	350 LBS	3006638	WASTE - FUEL SOAKED ABSORBENT	F3019-11		ASSETS 349605,352258 L 40" X W 48" X H 45"
1	WOOD CRATE	940 LBS	2002346	WASTE - BATTERIES, WET, NON-SP	F3019-13		ASSET 352259 L 48" X W 36" X H 22"
1	PALLET	870 LBS	2002406	WASTE - OIL, 45 GAL	F3019-12		ASSET 339432,334866 (NON-REGULATED) L 40" W 48" X H 42"
1	PALLET	870 LBS	2002358	WASTE - TANK BOTTOM WATER/ TAN	F3019-14		ASSET 349611 L 48" X W 40" X H 41"
1			2002343	WASTE - FUEL	F3019-14		ASSET 352279
1	PALLET	1740 LBS	2002358	WASTE - TANK BOTTOM WATER/ TAN	F3019-10		ASSETS 340247,352254 L 48" X W 48" X H 41"

**NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.**

<b>Received By:</b>	<b>Date</b>

Figure 3: NWS Shipping Manifest TCN-39707

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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> Jun 19, 2019, 2:25 PM		<b>TCN-39710</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> 1 PC			
				<b>Total Weight:</b> 2620 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	WOOD CRATE	2620 LBS.	2006439	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASET 152204 L 42" X W 33" X H 70" (UN 1013) CLASS 2.2
1			2006438	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASSET 152185
1			2006439	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASSET 152195
1			2006438	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASSET 152195
1			2006438	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASSET 152206
1			2006439	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASSET 152206
1			2006438	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASSET 152188
1			2006438	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASSET 152197
1			2006439	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASSET 152201
1			2006439	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASSET 152208
1			2006438	GAS, 75 LB CYL, CO2, PYRENE 95	F3019-17		ASSET 152207
1			1011493	GAS,OXYGEN,244 CU FT CYL,COMPR	F3019-17		ASSET 118290 (UN 1072) CLASS 2.2 (5.1)

**NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.**

<b>Received By:</b>	<b>Date</b>
<b>Received By:</b>	<b>Date</b>

Figure 4: NWS Shipping Manifest TCN-39710

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## ANNEX B: LOCATION OF LANDFILL WITH COORDINATES



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



**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



**ANNEX D: ANALYSIS OF DISCHARGED SEWAGE EFFLUENT**

The sewage outfall sump was sampled on 13-Sep-2019. The sample was analyzed 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 2019

Sample Date	Parameter				
	pH	Oil and Grease (Present - P / Absent - A)	Biological Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	Faecal Coliforms
13-Sep-2019	6.95	A	1440	2190	1,536,667



Environment Testing

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1917392  
Date Submitted: 2019-09-24  
Date Reported: 2019-10-01  
Project:  
COC #: 207978

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	BOD5	1	mg/L	1140	1455431 Sewage  2019-09-13 Fox-3 Sewage Outfall
	pH	1.00		6.95	
	Total Suspended Solids	2	mg/L	2190	
Oil and Grease	Oil & Grease - Mineral	1	mg/L	6	
	Oil & Grease - Non-mineral	1	mg/L	5	
	Oil & Grease - Total	1	mg/L	11	
	Visible Sheen		P/A	A	

Figure 5: 13-Sep-2019 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#: 17-00919  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1917404  
Date Submitted: 2019-09-24  
Date Reported: 2019-09-25  
Project:  
COC #: 207978

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Microbiology	Faecal Coliforms	0	ct/100mL		1455453 WW 2019-09-13 Fox-3 Sewage Outfall - A	1455454 WW 2019-09-13 Fox-3 Sewage Outfall - B	1455455 WW 2019-09-13 Fox-3 Sewage Outfall - C
					1710000	1270000	1630000

Figure 6: 13-Sep-2019 Sewage Effluent Results, Page 2 of 2

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**ANNEX E: ANALYSIS OF BERM WATER<sup>1</sup>**

The berm water was sampled on 20-May-2019. The sample was analyzed for the parameters listed in water licence 8BC-FOD1828 Part D, Item 12.

**Table E-1: Analysis of Berm Water at FOX-3 in 2019**

Berm	Maximum concentration of any grab sample (ug/L)	DEW W22A&B	DEW W22C&D	DEW W20D&E
Location on-site		Summit	Summit	Airstrip
Discharge Latitude <sup>2</sup>		68°39'5.43"N	68°39'3.67"N	68°37'24.90"N
Discharge Longitude		71°14'3.23"W	71°13'49.97"W	71° 8'5.62"W
Date		20-May-19	20-May-19	20-May-19
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



Environment Testing

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1909511  
Date Submitted: 2019-06-12  
Date Reported: 2019-06-19  
Project:  
COC #: 197628

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Oil and Grease	Oil & Grease - Total	1	mg/L		1432340 Water
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		2019-05-30 Berm F3 W22 A-B
Subcontract	Phenols	0.001	mg/L		
VOCs Surrogates	Toluene-d8	0	%		
Volatiles	Benzene	0.5	ug/L		
	Ethylbenzene	0.5	ug/L		
	Toluene	0.5	ug/L		

**Figure 7: DEW W22A&B berm water laboratory results**

<sup>1</sup> Effluent from bermed fuel storage facilities.

<sup>2</sup> Final discharge point of bermed fuel storage facility

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**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1909512  
Date Submitted: 2019-06-12  
Date Reported: 2019-06-19  
Project:  
COC #: 197630

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Oil and Grease	Oil & Grease - Total	1	mg/L		1432341 Water
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		2019-05-30 Berm F3 W22C
Subcontract	Phenols	0.001	mg/L		
VOCs Surrogates	Toluene-d8	0	%		
Volatiles	Benzene	0.5	ug/L		
	Ethylbenzene	0.5	ug/L		
	Toluene	0.5	ug/L		

Figure 8: DEW W22C&D berm water laboratory results



**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1909510  
Date Submitted: 2019-06-12  
Date Reported: 2019-06-19  
Project:  
COC #: 197627

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Oil and Grease	Oil & Grease - Total	1	mg/L		1432339 Water
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		2019-05-26 Berm F3 W20D +E
Subcontract	Phenols	0.001	mg/L		
VOCs Surrogates	Toluene-d8	0	%		
Volatiles	Benzene	0.5	ug/L		
	Ethylbenzene	0.5	ug/L		
	Toluene	0.5	ug/L		

Figure 9: DEW W20D&E berm water laboratory results

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