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2018 ANNUAL NUNAVUT WATER BOARD

REPORT FOR FOX-M

FOR THE
North Warning System

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

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EXECUTIVE SUMMARY IN ENGLISH FOLLOWS



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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 the licence issued 10 September 2009 3BC-FOH0919 – Type “B”, Part B “General Conditions”, paragraph 1. This report covers the period from 01 January to 31 December 2018.

RCL is the Operation and Maintenance Contractor for the North Warning System (NWS), including FOX-M, the attended (manned) NWS radar site located at Hall Beach, Nunavut.

The water usage at FOX-M in 2018 was 1031.5 cubic meters, which is an average of 2.8 cubic meters per day. There is no water usage limit in the licence for FOX-M because water is drawn from an artificial (man-made) reservoir and not from a natural source.

Sewage at FOX-M was processed by the tertiary wastewater treatment system. Some of the treated effluent is recycled as on site urinal/toilet flush water. The discharged treated effluent is of potable water quality. A sample of the treated effluent was sent for laboratory analysis each month in 2018.

Samples of 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-FOH0919, Part D, item 10 before the water was pumped out of the berms.

Hazardous waste and waste oil were sent 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. The hazardous waste consisted of 87 drums of assorted waste (oil, fuel, glycol, etc.).

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

Two outdoors spill occurred at FOX-M in 2018:

3. NT-NU Spill Line Report Number 18-222. On 12June2018, the loader was running while parked next to the building train. When the operator returned to the loader a hydraulic fluid leak was noted. The spill was immediately cleaned up and the loader was moved to the garage where the failed O-ring that caused the spill was replaced. The impacted gravel was collected and containerized for disposal.
4. NT-NU Spill Line Report Number 18-328. On 15Aug2018 site personnel were refuelling one of the site pickup trucks by vehicle refueller tank W21E. The auto stop handle failed the shut off the flow of fuel once the vehicle was full, which resulted in a Jet A1 release of approximately 1 Litre. The impacted soil was collected and transferred to a drum for off-site disposal.

The Spill Contingency Plan was successfully implemented.

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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 the licence issued 10 September 2009 3BC-FOH0919 – Type “B”, Part B “General Conditions”, paragraph 1. This report covers the period of 01 January to 31 December 2018.

RCL is the Operation and Maintenance Contractor for the North Warning System (NWS), including FOX-M. FOX-M is an attended (manned) North Warning System radar site located at Hall Beach, Nunavut.

1.1 Report Details

Licensee: Department of National Defence, Government of Canada
Licence: 3BC-FOH0919 – Type “B”
Location: FOX-M North Warning System Site, Hall Beach, 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

The water usage at FOX-M in 2018 was 1,031.5 cubic meters, which is an average of 2.8 cubic meters per day. See Table 2-1 for raw water usage.

There is no water usage limit in the licence for FOX-M because water is drawn from an artificial (man-made) reservoir and not from a natural source.

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

Month	Raw water usage (m ³)
January	67.5
February	84
March	87.5
April	65
May	81.5
June	69
July	69
August	93.5
September	149.5
October	103
November	87
December	75
TOTAL	1,031.5

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3.0 TREATED SEWAGE DISCHARGE

At FOX-M, the sewage and grey water were both processed through a Cycle-let® advanced tertiary wastewater treatment system. Some of the treated water is recycled as urinal/toilet flush water; the remainder is discharged at the designated outfall and is potable water quality. See Table 3-1, for the volume of sewage and grey water treated by the Cycle-let® system. See Section 6.0 for details on sewage effluent monitoring.

Table 3-1: Monthly and Annual Volume of Sewage and Grey Water Treated at FOX-M in 2018

Month	Volume of sewage and greywater treated then discharged or recycled (m ³)
January	69.5
February	84.0
March	101.0
April	65.0
May	81.5
June	69.0
July	104.5
August	98.5
September	149.5
October	103.0
November	87.0
December	82.0
TOTAL	1,094.5

4.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

Hazardous waste and waste oil were sent 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. The hazardous waste consisted of 87 drums of assorted waste (oil, fuel, glycol, etc.).

See Table 4-1 for the list of items sent for disposal.

See Annex A for the shipping documents including the completed movement documents for waste regulated under the Transportation of Dangerous Goods Regulations (TDGR) and NWS Manifests for non-regulated waste.

Table 4-1: Hazardous Waste and Waste Oil Sent for Disposal from FOX-M in 2018

Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste Jet A1 fuel	8 Drums	Movement Document 2464177-1
Waste fuel, aviation, turbine engine		
Waste Jet A1 fuel and water mixture	3 Drums	Movement Document 2464177-1
Waste fuel, aviation, turbine engine mixture		

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Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste Jet A1 fuel filters	3 Drums	Movement Document 2464177-1
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste fuel contaminated soil	5 Drums	Movement Document 2464177-1
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste POL soaked absorbent	3 Drums	Movement Document 2464177-1
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste aerosols (flammable)	1 Drum	Movement Document 2464177-1
Waste oily rags	6 Drums	Movement Document 2464177-1
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste oil	43 Drums	NWS Manifest TCN38415, TCN38418, TCN38416, TCN38430, TCN38432, TCN38433, TCN38436, TCN38406, TCN38408, TCN38409, TCN38407, TCN38404, TCN38420, TCN38417
Not TDG regulated		
Waste glycol (drum)	9 Drums	NWS Manifest TCN38415, TCN38418, TCN38434, TCN38455, TCN38420
Not TDG Regulated		
Waste Activated Carbon Filter	6 Drums	NWS Manifest TCN38457, TCN38458
Not Regulated		

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5.0 NON-HAZARDOUS SOLID WASTE DISPOSAL

Non-hazardous domestic solid waste was disposed of at the local landfill through a contract with the Municipality of Hall Beach. RCL has documented authorization from the community for receiving the waste. See Table 5-1 for the quantity of non-hazardous waste generated.

Table 5-1: Non-hazardous Domestic Solid Waste Sent for Disposal from FOX-M in 2018

Month	Waste Generated (kg)
January	950
February	1025
March	1204
April	889
May	966
June	989
July	1064
August	1241
September	1569
October	1188
November	932
December	1207
TOTAL	13,224

6.0 MONITORING PROGRAM

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

1. Volume of raw water drawn from the reservoir (FOH-1). The raw water monitoring information is shown in **Section 2.0 Water Use**.
2. Quality of sewage discharged from the final discharge point of the sewage treatment facility (FOH-2). The location of the sewage effluent outfall is shown in **Annex B**, including coordinates. The treated sewage was sampled monthly. The results of the analyses are shown in **Annex C: Analysis of Treated Sewage Effluent**
3. Quality of the water contained in the berms of fuel storage facilities prior to discharge (FOH-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 D: Location of Bermed Fuel Storage Facilities and Analysis of Berm Water**. All samples met the effluent requirements of the water licence, Part D.

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7.0 SPILLS (UNAUTHORIZED DISCHARGES)

Date, NT-NU Spill #	Product	Quantity	Cause and follow-up action	On-site location
12-Jun-2018, Spill # 18-222	Hydraulic fluid	1 L	On 12June2018, the loader was running while parked next to the building train. When the operator returned to the loader a hydraulic fluid leak was noted. The spill was immediately cleaned up and the loader was moved to the garage where the failed O-ring that caused the spill was replaced. The impacted gravel was collected and containerized for disposal.	20 metres from the north side of B-Train MOD-10 area. (68°45'41.7"N, 81°13'32.6"W)
15-Aug-2018, Spill # 18-328	Jet A1	1 L	On 15Aug2018 site personnel were refuelling one of the site pickup trucks by vehicle refueller tank W21E. The auto stop handle failed the shut off the flow of fuel once the vehicle was full, which resulted in a Jet A1 release of approximately 1 Litre. The impacted soil was collected and transferred to a drum for off-site disposal.	Vehicle Refueller (68°45'41"N, 81°13'31"W)

The Spill Contingency Plan was successfully implemented.

8.0 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 with the application for water licence renewal.

9.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

No progressive reclamation work was undertaken in 2018.

10.0 ACRONYMS

Table 10-1: Acronyms

Acronym	Definition
n.o.s	Not Otherwise Specified
NWB	Nunavut Water Board
NWS	North Warning System
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 Document for TDG Regulated waste and NWS Manifests for non-TDG Regulated waste described in Table 4-1 are below.

MOVEMENT DOCUMENT / MANIFEST DOCUMENT DE MOUVEMENT / MANIFESTE

This Movement Document/Manifest conforms to all federal and provincial transport and environmental legislation.
Ce document de mouvement/manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport.

2464177-1

A Generator / consignor Producteur / expéditeur		B Carrier Transporteur		23 Reference No. of other movement document(s)/manifest(s) used / N° de référence des autres documents de mouvement/manifestes utilisés	
Registration No. / Provincial ID No. N° d'immatriculation - id. provincial		Registration No. / Provincial ID No. N° d'immatriculation - id. provincial			
NUIG 100003		NEAS (NUNAVUT eastern Arctic ship inc.)			
Company name / Nom de l'entreprise		Mailing address / Adresse postale		24 Receiver / consignee Récepteur/destinataire	
Department of National Defence 40 RCL Wings, Bldg 109 Hornell Heights ON P0H 1P3		City / Ville Province Postal code / Code postal		Registration No. / Provincial ID No. N° d'immatriculation - id. provincial	
7205-494-2011 ext 2864		2100 Ave. Pierre-Dupuy Suite 200 Montreal, QC, H3C 3R5		25 Reference No. of other movement document(s)/manifest(s) used / N° de référence des autres documents de mouvement/manifestes utilisés	
E-mail / Courriel électronique		Email / Courriel électronique		26 Receiver / consignee information same as in Part A Les renseignements du récepteur/destinataire est la même qu'à la Partie A <input type="checkbox"/> Yes / Oui <input type="checkbox"/> No, complete the box below / Non, remplir la case ci-dessous	
Tel. No. / N° de tél.		Tel. No. / N° de tél.			
Shipping site address / Adresse du lieu de l'expédition		Registration No. / N° d'immatriculation		27 Company name / Nom de l'entreprise	
NWS LSS Hall Beach P.O. Box 46		Prov. / Prov.		Mailing address / Adresse postale	
City / Ville Province Postal code / Code postal		28 Vehicle / Véhicule		28 Company name / Nom de l'entreprise	
Hall Beach NU X0A 0K0		Trailer - Rail car No. 1 1 st remorque - wagon		Mailing address / Adresse postale	
Intended Receiver / consignee Récepteur/destinataire prévu		Trailer - Rail car No. 2 2 nd remorque - wagon		City / Ville Province Postal code / Code postal	
Registration No. / Provincial ID No. N° d'immatriculation - id. provincial		Port of entry Point d'entrée		29 E-mail / Courriel électronique	
7670-16-01-28643		international use only		Tel. No. / N° de tél.	
Qikiqtaaluk Environmental 401695006		Port of exit Point de sortie		30 Receiving site address / Adresse du lieu de destination	
Mailing address / Adresse postale		international use only		Date received / Date de réception	
City / Ville Province Postal code / Code postal		31 Year / Année Month / Mois Day / Jour Time / Heure		32 Tel. No. / N° de tél.	
2235 de Charette neuf 300 Brossard QC J4Z 3V4		33 Signature		33 A.M. <input type="checkbox"/> P.M. <input type="checkbox"/>	
E-mail / Courriel électronique		34 If waste or recyclable material to be transferred, specify intended company name! Si les déchets ou matières recyclables doivent être transférées, préciser le nom du destinataire		34 Registration No./Provincial ID No. N° d'immatriculation - id. provincial	
Tel. No. / N° de tél.		35 Quantity received Quantité reçue		35 Quantity received Quantité reçue	
Jodin@genv.ca ()		36 Units Unité		36 Units Unité	
Receiving site address / Adresse du lieu de l'expédition		Comments Commentaires		37 Comments Commentaires	
Véolia, 2630, boul. Industriel		37 Handling / Code de manutention		37 Handling / Code de manutention	
Chambly QC J3L 4V2		Accepted / Accepté <input type="checkbox"/>		Accepted / Accepté <input type="checkbox"/>	
Prov. code Code prov.		38 Shipment / Envoi		38 Shipment / Envoi	
Shipping name Appellation réglementaire		39 Refused / Refusé <input type="checkbox"/>		39 Refused / Refusé <input type="checkbox"/>	
3 Class / Classe Sub. classées Catégorie a.b.		40 Decont. / Packing / Risk gr. 7 Gr. d'emballage/ de risque		40 Decont. / Packing / Risk gr. 7 Gr. d'emballage/ de risque	
4 UN No. N° UNI		41 Quantity shipped Quantité expédiée		41 Quantity shipped Quantité expédiée	
5 Basel Annex VIII or OECD Code Annexe VIII de l'OCDE ou Code OECD		42 Unit Unité		42 Unit Unité	
6 H code Code H		43 Export Exportation		43 Export Exportation	
7 Y code Code Y		44 Import Importation		44 Import Importation	
8 Customs code(s) Code(s) de douanes		45 Packaging/Container Codes Ht.-ext.		45 Packaging/Container Codes Ht.-ext.	
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SOW Ref: 16.F.5.d



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: DVAUGHN	Date: Jul 28, 2018, 2:22 PM	TCN-38404		
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		From: 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	Priority 2	
Attention:	Attention:			
Carrier: NEAS	Routing: 36" X 24" X 40"	Waybill #: DR-C22526	Total Pcs. 1	Total Weight: 350 LBS
QTY Order	Type Line Weight	Item Description	WO or PO F318-19	B/Code or S/N Remarks NON-REGULATED...ASSET 347831
1	PALLET	2002406 WASTE - OIL, 45 GAL		
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.		Received By:	Date	
		Received By:	Date	

Figure 2: NWS Shipping Manifest TCN-38404



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: DVAUGHN	Date: Jul 28, 2018, 2:35 PM	TCN-38405		
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		From: 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	Priority 2	
Attention:	Attention:			
Carrier: NEAS	Routing: 54" X 54" X 44"	Waybill #: 1	Total Pcs. 1	Total Weight: 1200 LBS
QTY Order	Type Line Weight	Item Description	WO or PO F318-7	B/Code or S/N Remarks UN3175...ASSET 344584
1	PALLET	2002505 WASTE - OILY RAGS		
1		2002357 WASTE - FUEL CONTAMINATED SOIL	F318-7	UN3175...ASSET 340876
1		2002356 WASTE - OIL FILTERS	F318-7	ASSET 344585
1		2003635 WASTE - FUEL FILTERS (DRUM)	F318-7	UN3175...ASSET 349093
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.		Received By:	Date	
		Received By:	Date	

Figure 3: NWS Shipping Manifest TCN-38405

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SOW Ref: 16.F.5.d



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: DVAUGHN	Date: Jul 28, 2018, 3:29 PM	TCN-38406		
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		From: 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	Priority	2
Attention:		Attention:		
Carrier: NEAS		Routing: 48" x 48" x 43"	Waybill #: DR-C22526	Total Pcs. 1 Total Weight: 1800 LBS
QTY Order	Type Line Weight	Item Description	WO or PO B/Code or S/N	Remarks
4	PALLET	2002406 WASTE - OIL, 45 GAL	F318-6	NON-REGULATED...ASSETS 347761, 347763, 347765, 347829
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.			Received By:	Date
			Received By:	Date

Figure 4: NWS Shipping Manifest TCN-38406



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: DVAUGHN	Date: Jul 28, 2018, 3:33 PM	TCN-38407		
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		From: 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	Priority	2
Attention:		Attention:		
Carrier: NEAS		Routing: 48" x 48" x 43"	Waybill #: DR-C22526	Total Pcs. 1 Total Weight: 1800 LBS
QTY Order	Type Line Weight	Item Description	WO or PO B/Code or S/N	Remarks
4	PALLET	2002406 WASTE - OIL, 45 GAL	F318-5	NON REGULATED...ASSETS 347762, 339989, 345519, 347760
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.			Received By:	Date
			Received By:	Date

Figure 5: NWS Shipping Manifest TCN-38407

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SOW Ref: 16.F.5.d

		SHIPPING MANIFEST					
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8		NON NEGOTIABLE					
Filled By: DVAUGHN		Date: Jul 28, 2018, 4:04 PM		TCN-38408			
Ship To: QIKIQTALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367			From: 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		Priority 2		
Attention:		Attention:					
Carrier: NEAS		Routing: 48" x 24" x 43"		Waybill #:	Total Pcs.	Total Weight:	
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
2	PALLET		2002406	WASTE - OIL, 45 GAL	F318-8		NON-REGULATED...ASSETS 345520, 345521
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.					Received By:	Date	
					Received By:	Date	

Figure 6: NWS Shipping Manifest TCN-38408

		SHIPPING MANIFEST					
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8		NON NEGOTIABLE					
Filled By: DVAUGHN		Date: Jul 28, 2018, 4:08 PM		TCN-38409			
Ship To: QIKIQTALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367			From: 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		Priority 2		
Attention:		Attention:					
Carrier: NEAS		Routing: 56" x 30" x 45"		Waybill #:	Total Pcs.	Total Weight:	
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
2	PALLET		2002406	WASTE - OIL, 45 GAL	F318-9		NON-REGULATED...ASSETS 347764, 347830
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.					Received By:	Date	
					Received By:	Date	

Figure 7: NWS Shipping Manifest TCN-38409

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SOW Ref: 16.F.5.d

		SHIPPING MANIFEST					
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8		NON NEGOTIABLE					
Filled By: CMACDONALD		Date: Oct 16, 2015, 10:07 AM		TCN-34816			
Ship To: CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA		From: LSS-Q, LSS IQALUIT, DND Storeroom Raytheon Canada Limited, LSS Iqaluit: BLDG. #2050 P.O. Box 1229 Iqaluit, NU, X0A 0H0 867-979-4818		Priority 1			
Attention:		Attention:					
Carrier: NEAS		Routing: IQALUIT-MONTREAL		Waybill #:	Total Pcs.	Total Weight:	
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
41	CRATE	1450 LBS	2003658	WASTE - OIL (5 GALLON PAIL)	N/A	N/A	EIN AS FOLLOWS
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.				Received By:	Date		
				Received By:	Date		

Figure 8: NWS Shipping Manifest TCN-34816

		SHIPPING MANIFEST					
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8		NON NEGOTIABLE					
Filled By: DVAUGHN		Date: Jul 31, 2018, 11:45 AM		TCN-38417			
Ship To: QIKIQTAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		From: 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		Priority 2			
Attention:		Attention:					
Carrier: NEAS		Routing: 48" X 45" X 43"		Waybill #:	Total Pcs.	Total Weight:	
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4	PALLET	2002406	WASTE - OIL, 45 GAL	XL18-17	NON-REGULATED...ASSETS 344608, 332058, 335584, 341359		
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.				Received By:	Date		
				Received By:	Date		

Figure 9: NWS Shipping Manifest TCN-38417

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SOW Ref: 16.F.5.d



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: DVAUGHN	Date: Jul 31, 2018, 1:30 PM	TCN-38418					
Ship To: QIKIQTAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLAY, QC, J3L 4V2 1-866-634-6367		From: 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	Priority 2				
Attention:		Attention:					
Carrier: NEAS		Routing: 48" X 47" X 49"	Waybill #: DR-C22521	Total Pcs. 1 Total Weight: 1800 LBS			
QTY Order	Type	Line Weight	Item	Description	WD or PO	B/Code or S/N	Remarks
3	PALLET		2002406	WASTE - OIL, 45 GAL	XL18-9		NON-REGULATED...ASSETS 341367, 345855, 339424
1			2002344	WASTE - GLYCOL (DRUM)	XL18-9		NON-REGULATED...ASSET 350457
0							*Original Asset 332106 was duplicated on TCN 38434. Created new Asset 350457.
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.					Received By:	Date	
					Received By:	Date	

Figure 10: NWS Shipping Manifest TCN-38418

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SOW Ref: 16.F.5.d

		SHIPPING MANIFEST					
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8		NON NEGOTIABLE					
Filled By: DVAUGHN		Date: Jul 31, 2018, 4:02 PM		TCN-38420			
Ship To: QIKIQTAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLAY, QC, J3L 4V2 1-866-634-6367			From: 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		Priority 2		
Attention:		Attention:					
Carrier: NEAS		Routing: 48" X 46" X 42"		Waybill #: DR-C22526	Total Pcs. 1	Total Weight: 1800 LBS	
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
0					XL18-21		*Original Asset 339424 was duplicated on TCN 38418. Created new Asset 350453.
3	PALLET	2002406	WASTE - OIL, 45 GAL		XL18-21		NON-REGULATED...ASSETS 350453, 339426, 349011
1		2002344	WASTE - GLYCOL (DRUM)		XL18-21		NON-REGULATED...ASSET 349424
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.					Received By:	Date	
					Received By:	Date	

Figure 11: NWS Shipping Manifest TCN-38420

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SOW Ref: 16.F.5.d

		SHIPPING MANIFEST					
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8						NON NEGOTIABLE	
Filled By: DVAUGHN			Date: Aug 2, 2018, 10:41 AM				TCN-38430
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367			From: 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			Priority 2	
Attention:			Attention:				
Carrier: NEAS		Routing: 48" X 40" X 42"	Waybill #: DR-C22524	Total Pcs. 1	Total Weight: 900 LBS		
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
2	PALLET	2002406	WASTE - OIL, 45 GAL		XL18-6		NON-REGULATED..ASSETS 350454, 347296
0							*Original Asset 339426 was duplicated on TCN 38420. Created new Asset 350454.
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.				Received By:	Date		
				Received By:	Date		

Figure 12: NWS Shipping Manifest TCN-38430

		SHIPPING MANIFEST					
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8						NON NEGOTIABLE	
Filled By: DVAUGHN			Date: Aug 2, 2018, 10:43 AM				TCN-38432
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367			From: 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			Priority 2	
Attention:			Attention:				
Carrier: NEAS		Routing: 48" X 48" X 41"	Waybill #: DR-C22521	Total Pcs. 1	Total Weight: 1800 LBS		
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4	PALLET	2002406	WASTE - OIL, 45 GAL		XL18-8		NON-REGULATED..ASSETS 338926, 340445, 349165, 349166
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.				Received By:	Date		
				Received By:	Date		

Figure 13: NWS Shipping Manifest TCN-38432

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SOW Ref: 16.F.5.d

		SHIPPING MANIFEST					
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8						NON NEGOTIABLE	
Filled By: DVAUGHN			Date: Aug 2, 2018, 10:47 AM				TCN-38433
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367			From: 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			Priority 2	
Attention:		Attention:					
Carrier: NEAS		Routing: 48" X 46" X 44"		Waybill #:	Total Pcs.	Total Weight:	
QTY Order	Type Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks	
4	PALLET	2002406	WASTE - OIL, 45 GAL	XL18-11	NON-REGULATED...ASSETS 339437, 345734, 345735, 349167		
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.				Received By:	Date		
				Received By:	Date		

Figure 14: NWS Shipping Manifest TCN-38433

		SHIPPING MANIFEST					
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8						NON NEGOTIABLE	
Filled By: DVAUGHN			Date: Aug 2, 2018, 10:49 AM				TCN-38434
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367			From: 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			Priority 2	
Attention:		Attention:					
Carrier: NEAS		Routing: 48" X 48" X 42"		Waybill #:	Total Pcs.	Total Weight:	
QTY Order	Type Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks	
4	PALLET	2002344	WASTE - GLVCOL (DRUM)	XL18-12	NON-REGULATED...ASSETS 332106, 347303, 344583, 349168		
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.				Received By:	Date		
				Received By:	Date		

Figure 15: NWS Shipping Manifest TCN-38434

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SOW Ref: 16.F.5.d



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: DVAUGHN	Date: Aug 2, 2018, 10:55 AM	TCN-38436			
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367	From: 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	Priority 2			
Attention:	Attention:				
Carrier: NEAS	Routing: 48" X 47" X 41"	Waybill #: DR-C22521	Total Pcs. 1	Total Weight: 1800 LBS	
QTY Order	Type Line Weight	Item Item	Description	WO or PO B/Code or S/N	Remarks
4	PALLET	2002406	WASTE - OIL, 45 GAL	XL18-16	NON-REGULATED...ASSETS 349013, 349012, 349171, 349172
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.				Received By:	Date
				Received By:	Date

Figure 16: NWS Shipping Manifest TCN-38436



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: DVAUGHN	Date: Aug 3, 2018, 11:04 AM	TCN-38455			
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367	From: 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	Priority 2			
Attention:	Attention:				
Carrier: NEAS	Routing: 24" X 42" X 40"	Waybill #: DR-C22524	Total Pcs. 1	Total Weight: 500 LBS	
QTY Order	Type Line Weight	Item Item	Description	WO or PO B/Code or S/N	Remarks
0					*Original Asset 347303 was duplicated on TCN 38434. Created new Asset 350455.
1	PALLET	2002344	WASTE - GLYCOL (DRUM)	XL18-24	NON-REGULATED...ASSET 350455
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.				Received By:	Date
				Received By:	Date

Figure 17: NWS Shipping Manifest TCN-38455

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SOW Ref: 16.F.5.d



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: DVAUGHN	Date: Aug 3, 2018, 11:09 AM	TCN-38457			
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLAY, QC, J3L 4V2 1-866-634-6367		From: 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	Priority 2		
Attention:	Attention:				
Carrier: NEAS	Routing: 48" X 48" X 24"	Waybill #: DR-C22524	Total Pcs. 1	Total Weight: 1540 LBS	
QTY Order	Type Line Weight	Item Item	Description	WO or PO B/Code or S/N	Remarks
4	PALLET	2002351	WASTE - ACTIVATED CARBON FILTE	XL18-7	NON-REGULATED...ASSETS 349098, 349099, 349100, 349101
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.				Received By:	Date
				Received By:	Date

Figure 18: NWS Shipping Manifest TCN-38457



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: DVAUGHN	Date: Aug 3, 2018, 11:11 AM	TCN-38458			
Ship To: QIKIQTAAULK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLAY, QC, J3L 4V2 1-866-634-6367		From: 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	Priority 2		
Attention:	Attention:				
Carrier: NEAS	Routing: 48" X 40" X 42"	Waybill #: DR-C22524	Total Pcs. 1	Total Weight: 810 LBS	
QTY Order	Type Line Weight	Item Item	Description	WO or PO B/Code or S/N	Remarks
2	PALLET	2002351	WASTE - ACTIVATED CARBON FILTE	XL18-13	NON-REGULATED...ASSETS 349102, 349103
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.				Received By:	Date
				Received By:	Date

Figure 19: NWS Shipping Manifest TCN-38458

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SOW Ref: 16.F.5.d

ANNEX B: TREATED SEWAGE EFFLUENT OUTFALL (FOH-2) LOCATION WITH CO-ORDINATES



Coordinates of sewage treatment outfall: 63° 45'39.50"N, 81°13'28.40"W.

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SOW Ref: 16.F.5.d

ANNEX C: ANALYSIS OF TREATED SEWAGE EFFLUENT

Table C-1: Summary of Analysis of Treated Sewage Effluent at FOX-M 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 ¹
Maximum Concentration	6.0 to 9.0 (pH units)	No visible sheen	120 mg/L	180 mg/L	10,000 CFU/100 mL
8-Jan-18	7.39	A	<1	2	0
2-Feb-18	7.39	A	<1	<2	3
5-Mar-18	8.12	A	2	3	0
2-Apr-18	7.84	A	1	19	4
7-May-18	7.46	A	<1	<2	61
5-Jun-18	7.88	A	<1	<2	0
9-Jul-18	7.18	A	<1	<2	7
7-Aug-18	7.66	A	<1	2	0
6-Sep-18	7.64	A	14	5	0
1-Oct-18	7.65	A	8	<2	813
1-Nov-18	7.99	P	<1	<2	28
10-Dec-18	7.41	A	<1	<2	9

¹ This column contains the average of the Cyclot 1A, Cyclot 1B, and Cyclot 1C

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Environment Testing

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Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02611-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1800787
Date Submitted: 2018-01-17
Date Reported: 2018-01-23
Project: Fox-Main
COC #: 184709

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	pH	1.00			1341324 Sewage 2018-01-08 Fox-Main Cyclot
Oil & Grease	Total Suspended Solids	2	mg/L	2	
	Oil & Grease - Mineral	1	mg/L	<1	
	Oil & Grease - Non-mineral	1	mg/L	<1	
Subcontract	Oil & Grease - Total	1	mg/L	<1	
	BOD5	1	mg/L	<1	
Visible Sheen	Visible Sheen		P/A	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

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Page 2 of 3

Figure 20: January 2018, sewage effluent laboratory 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#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1800826
Date Submitted: 2018-01-17
Date Reported: 2018-01-18
Project: COC #: 184709

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1341444 Sewage 2018-01-08 Fox Main Cyclot 1A	1341445 Sewage 2018-01-08 Fox Main Cyclot 1B	1341446 Sewage 2018-01-08 Fox Main Cyclot 1C
Others	Faecal Coliforms	0	ct/100mL			0	0	0

Figure 21: January 2018, sewage effluent laboratory results page 2 of 2

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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#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1801867
Date Submitted: 2018-02-07
Date Reported: 2018-02-14
Project: FOX-MAIN
COC #: 184702

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1344306 Sewage 2018-02-01 FOX-MAIN CYCLE-LET
General Chemistry	pH	1.00			7.39	
Oil & Grease	Total Suspended Solids	2	mg/L		<2	
	Oil & Grease - Mineral	1	mg/L		<1	
	Oil & Grease - Non-mineral	1	mg/L		<1	
Subcontract	Oil & Grease - Total	1	mg/L		<1	
	BOD5	1	mg/L		<1	
Visible Sheen	Visible Sheen		P/A		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

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Page 2 of 3

Figure 22: February 2018, sewage effluent laboratory 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#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1801866
Date Submitted: 2018-02-07
Date Reported: 2018-02-08
Project: FOX-MAIN
COC #: 184702

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1344303 Sewage 2018-02-01 FOX-MAIN CYCLE-LET A	1344304 Sewage 2018-02-01 FOX-MAIN CYCLE-LET B	1344305 Sewage 2018-02-01 FOX-MAIN CYCLE-LET C
Others	Faecal Coliforms	0	ct/100mL		3	3	3	2

Figure 23: February 2018, sewage effluent laboratory results page 2 of 2

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Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02611-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1803430
Date Submitted: 2018-03-09
Date Reported: 2018-03-21
Project: FOX-Main
COC #: 184706

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1348337 Wastewater 2018-03-05 FOX-Main Cyclet
General Chemistry	pH	1.00				8.12
Oil & Grease	Total Suspended Solids	2	mg/L			3
	Oil & Grease - Mineral	1	mg/L			<1
	Oil & Grease - Non-mineral	1	mg/L			<1
Subcontract	Oil & Grease - Total	1	mg/L			<1
	BOD5	1	mg/L			2
Visible Sheen	Visible Sheen		P/A			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

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Page 2 of 3

Figure 24: March 2018, sewage effluent laboratory 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#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1803416
Date Submitted: 2018-03-09
Date Reported: 2018-03-11
Project: FOX-Main
COC #: 184706

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1348292 Sewage 2018-03-05 Fox-Main Cyclet A	1348293 Sewage 2018-03-05 Fox-Main Cyclet B	1348294 Sewage 2018-03-05 Fox-Main Cyclet C
Others	Faecal Coliforms	0	cf/100mL			0	0	0

Figure 25: March 2018, sewage effluent laboratory results page 2 of 2

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa

400 Cooper St.

Ottawa, ON

K2P 2H8

Attention: Mr. Will Wyman

PO#:

Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1804979
Date Submitted: 2018-04-06
Date Reported: 2018-04-11
Project: Fox-Main
COC #: 183409

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1352512 Sewage 2018-04-02 FOX-MAIN CYCLE-LET
General Chemistry	pH	1.00				7.84
	Total Suspended Solids	2	mg/L			19
Nutrients	BOD5	1	mg/L			1
Oil & Grease	Oil & Grease - Mineral	1	mg/L			<1
	Oil & Grease - Non-mineral	1	mg/L			<1
	Oil & Grease - Total	1	mg/L			<1
Visible Sheen	Visible Sheen		P/A			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

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Page 2 of 3

Figure 26: April 2018, sewage effluent laboratory results page 1 of 2



Certificate of Analysis

Client: Raytheon Canada Limited Ottawa

400 Cooper St.

Ottawa, ON

K2P 2H8

Attention: Mr. Will Wyman

PO#:

Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1804999
Date Submitted: 2018-04-06
Date Reported: 2018-04-08
Project: Fox-Main
COC #: 183409

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1352590 Sewage 2018-04-02 Fox-Main-Cycle-let A	1352591 Sewage 2018-04-02 Fox-Main-Cycle-let B	1352592 Sewage 2018-04-02 Fox-Main-Cycle-let C
Others	Faecal Coliforms	0	ct/100mL			1	6	4

Figure 27: April 2018, sewage effluent laboratory results page 2 of 2

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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#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1807312
Date Submitted: 2018-05-11
Date Reported: 2018-05-18
Project: FOX-Main
COC #: 184705

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1358507 WW 2018-05-07 Fox-Main Cyclct
General Chemistry	pH	1.00				7.46
	Total Suspended Solids	2	mg/L			<2
Nutrients	BOD5	1	mg/L			<1
	Oil & Grease - Mineral	1	mg/L			<1
	Oil & Grease - Non-mineral	1	mg/L			<1
Oil & Grease	Oil & Grease - Total	1	mg/L			<1
	Visible Sheen		P/A			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

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Page 2 of 3

Figure 28: May 2018, sewage effluent laboratory results page 1 of 2



Environment Testing

Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
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Ottawa, ON
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Attention: Mr. Will Wyman
PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1807330
Date Submitted: 2018-05-11
Date Reported: 2018-05-13
Project: FOX-Main
COC #: 184705

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1358544 WW 2018-05-07 FOX-Main Cyclct A	1358545 WW 2018-05-07 FOX-Main Cyclct B	1358546 WW 2018-05-07 FOX-Main Cyclct C
Others	Faecal Coliforms	0	ct/100mL			36	39	109

Figure 29: May 2018, sewage effluent laboratory results page 2 of 2

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Attention: Mr. Will Wyman
PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1809414
Date Submitted: 2018-06-11
Date Reported: 2018-06-18
Project: FOX-Main
COC #: 184690

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1364554 WW 2018-06-05 FOX-Main Cyclct LCT
General Chemistry	BOD5	1	mg/L	<1		
	pH	1.00		7.88		
Oil and Grease	Total Suspended Solids	2	mg/L	<2		
	Oil & Grease - Mineral	1	mg/L	<1		
	Oil & Grease - Non-mineral	1	mg/L	<1		
	Oil & Grease - Total	1	mg/L	<1		
	Visible Sheen		P/A	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

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Page 2 of 3

Figure 30: June 2018, sewage effluent laboratory results page 1 of 2



Environment Testing

Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
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Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1809433
Date Submitted: 2018-06-11
Date Reported: 2018-06-12
Project: Fox-Main
COC #: 184690

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1364599 Sewage 2018-06-05 FOX-MAIN CYLE-LET A	1364600 Sewage 2018-06-05 FOX-MAIN CYLE-LET B	1364601 Sewage 2018-06-05 FOX-MAIN CYLE-LET C
Others	Faecal Coliforms	0	ct/100mL			1	0	0

Figure 31: June 2018, sewage effluent laboratory results page 2 of 2

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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: 1812245
Date Submitted: 2018-07-13
Date Reported: 2018-07-20
Project: COC #: 188713

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1373862 Sewage 2018-07-09 FOX-MAIN CYCLE-LET
General Chemistry	BOD5	1	mg/L	<1		
	pH	1.00		7.18		
	Total Suspended Solids	2	mg/L	<2		
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		
	Visible Sheen		P/A	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

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

Page 2 of 3

Figure 32: July 2018, sewage effluent laboratory 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: 1812272
Date Submitted: 2018-07-13
Date Reported: 2018-07-14
Project: COC #: 188713

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1373920 Sewage 2018-07-09 Fox-Main Cycle-Let-A	1373921 Sewage 2018-07-09 Fox-Main Cycle-Let-B	1373922 Sewage 2018-07-09 Fox-Main Cycle-Let-C
Others	Faecal Coliforms	0	ct/100mL	7 11 4				

Figure 33: July 2018, sewage effluent laboratory results page 2 of 2

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
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Ottawa, ON
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Attention: Mr. Will Wyman
PO#: 002160-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1814487
Date Submitted: 2018-08-15
Date Reported: 2018-08-21
Project: COC #: 834700

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1380825 Sewage 2018-08-07 Fox-Main Cycle-Let
General Chemistry	BOD5	1	mg/L	<1		
	pH	1.00		7.66		
	Total Suspended Solids	2	mg/L	2		
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		
	Visible Sheen		P/A	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

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Page 2 of 3

Figure 34: August 2018, sewage effluent laboratory results page 1 of 2



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: 1814529
Date Submitted: 2018-08-15
Date Reported: 2018-08-16
Project: COC #: 834700

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1381001 Sewage 2018-08-15 Fox-Main Cycle-Let A	1381002 Sewage 2018-08-15 Fox-Main Cycle-Let B	1381003 Sewage 2018-08-15 Fox-Main Cycle-Let C
Others	Faecal Coliforms	0	ct/100mL			0	0	0

Figure 35: August 2018, sewage effluent laboratory results page 2 of 2

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Environment Testing

Certificate of Analysis

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

Report Number: 1816477
Date Submitted: 2018-09-12
Date Reported: 2018-09-19
Project:
COC #: 835617

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1386764 Sewage 2018-09-06 Fox-Main Cycle-Let
Group	Analyte	MRL	Units	Guideline		
General Chemistry	BOD5	1	mg/L	14		
	pH	1.00		7.64		
	Total Suspended Solids	2	mg/L	5		
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		
	Visible Sheen		P/A	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

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Page 2 of 3

Figure 36: September 2018, sewage effluent laboratory 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: 1816489
Date Submitted: 2018-09-12
Date Reported: 2018-09-13
Project:
COC #: 835617

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1386792 Sewage 2018-09-06 Fox-Main Cycle-Let - A	1386793 Sewage 2018-09-06 Fox-Main Cycle-Let - B	1386794 Sewage 2018-09-06 Fox-Main Cycle-Let - C
Group	Analyte	MRL	Units	Guideline				
Others	Faecal Coliforms	0	ct/100mL	0		0	0	0

Figure 37: September 2018, sewage effluent laboratory results page 2 of 2

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Environment Testing

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

Report Number: 1818356
Date Submitted: 2018-10-09
Date Reported: 2018-10-16
Project: COC #: 836399

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1392131 Sewage 2018-10-01 Fox-Main Cycle-Let
General Chemistry	BOD5	1	mg/L			8
	pH	1.00				7.65
Oil and Grease	Total Suspended Solids	2	mg/L			<2
	Oil & Grease - Mineral	1	mg/L			<1
	Oil & Grease - Non-mineral	1	mg/L			<1
	Oil & Grease - Total	1	mg/L			<1
	Visible Sheen		P/A			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

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Page 2 of 3

Figure 38: October 2018, sewage effluent laboratory 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: 1818335
Date Submitted: 2018-10-09
Date Reported: 2018-10-10
Project: COC #: 836399

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1392088 Sewage 2018-10-01 Fox-Main Cycle-Let - A	1392089 Sewage 2018-10-01 Fox-Main Cycle-Let - B	1392090 Sewage 2018-10-01 Fox-Main Cycle-Let - C
Others	Faecal Coliforms	0	ct/100mL			690	940	810

Figure 39: October 2018, sewage effluent laboratory results page 2 of 2

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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: 1820274
Date Submitted: 2018-11-07
Date Reported: 2018-11-14
Project:
COC #: 837597

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1397669 Sewage 2018-11-01 Fox-Main Cycle-let
Group	Analyte	MRL	Units	Guideline		
General Chemistry	BOD5	1	mg/L	<1		
	pH	1.00		7.99		
	Total Suspended Solids	2	mg/L	<2		
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		
	Visible Sheen	0	A/P	P		

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 40: November 2018, sewage effluent laboratory results page 1 of 2



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: 1820323
Date Submitted: 2018-11-07
Date Reported: 2018-11-08
Project:
COC #: 837597

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1397775 Sewage 2018-11-01 Fox-Main Cycle-let A	1397776 Sewage 2018-11-01 Fox-Main Cycle-let B	1397777 Sewage 2018-11-01 Fox-Main Cycle-let C
Group	Analyte	MRL	Units	Guideline				
Others	Faecal Coliforms	0	ct/100mL	17	19	47		

Figure 41: November 2018, sewage effluent laboratory results page 2 of 2

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

Report Number: 1822406
Date Submitted: 2018-12-13
Date Reported: 2018-12-19
Project:
COC #: 838968

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1403970 Sewage 2018-12-10 Fox-Main Cycle-Let
Group	Analyte	MRL	Units	Guideline		
General Chemistry	BOD5	1	mg/L		2	
	pH	1.00			7.46	
Oil and Grease	Total Suspended Solids	2	mg/L		<2	
	Oil & Grease - Mineral	1	mg/L		<1	
	Oil & Grease - Non-mineral	1	mg/L		<1	
	Oil & Grease - Total	1	mg/L		<1	
	Visible Sheen		P/A		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

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Page 2 of 3

Figure 42: December 2018, sewage effluent laboratory results page 1 of 2



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

Report Number: 1822429
Date Submitted: 2018-12-13
Date Reported: 2018-12-14
Project:
COC #: 838968

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1404061 Sewage 2018-12-10 Raytheon // Fox-Main Cycle-Let A	1404062 Sewage 2018-12-10 Raytheon // Fox-Main Cycle-Let B	1404063 Sewage 2018-12-10 Raytheon // Fox-Main Cycle-Let C
Group	Analyte	MRL	Units	Guideline				
Microbiology	Faecal Coliforms	0	ct/100mL		6	10	10	

Figure 43: December 2018, sewage effluent laboratory results page 2 of 2

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ANNEX D: LOCATION OF BERMED FUEL STORAGE FACILITIES AND ANALYSIS OF BERM WATER²

Table D-1: Analysis of Berm Water at FOX-M in 2018

Berm	Maximum concentration of any grab sample (ug/L)	HAL W20B	HAL W20D&E	HAL W20F	HAL W22A	HAL W22B
Location on-site		Beach	Airstrip	Beach	Summit	Summit
Discharge Latitude ³		68°46'23.9 3"N	68°46'15.8 5"N	68°46'23.7 5"N	68°45'42.2 4"N	68°45'43.0 0"N
Discharge Longitude		81°12'51.1 1"W	81°13'58.3 3"W	81°12'46.1 2"W	81°13'25.0 4"W	81°13'27.2 7"W
Date		25-Jun-18	23-Jun-18	25-Jun-18	23-Jun-18	23-Jun-18
pH (pH Units)		6 to 9	7.76	7.77	7.86	7.88
Oil and Grease (ug/L)	5000	<1000	<1000	<1000	<1000	<1000
Arsenic (total) (ug/L)	100	<20	<20	<20	<20	<20
Cadmium (dissolved) (ug/L)	10	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (dissolved) (ug/L)	100	<1	1	<1	<1	<1
Cobalt (dissolved) (ug/L)	50	<0.2	<0.2	<0.2	<0.2	<0.2
Copper (dissolved) (ug/L)	200	1	1	2	1	4
Lead (dissolved) (ug/L)	50	<1	<1	<1	<1	<1

² Effluent from bermed fuel storage facilities.

³ Final discharge point of bermed fuel storage facility

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Berm	Maximum concentration of any grab sample (ug/L)	HAL W20B	HAL W20D&E	HAL W20F	HAL W22A	HAL W22B
Location on-site		Beach	Airstrip	Beach	Summit	Summit
Discharge Latitude		68°46'23.9 3"N	68°46'15.8 5"N	68°46'23.7 5"N	68°45'42.2 4"N	68°45'43.0 0"N
Discharge Longitude		81°12'51.1 1"W	81°13'58.3 3"W	81°12'46.1 2"W	81°13'25.0 4"W	81°13'27.2 7"W
Date		25-Jun-18	23-Jun-18	25-Jun-18	23-Jun-18	23-Jun-18
Mercury (total) (ug/L)		0.6	<0.1	<0.1	<0.1	<0.1
Nickel (dissolved) (ug/L)	200	<5	<5	<5	<5	<5
PCB (total) (ug/L)	1000	<0.1	<0.1	<0.1	<0.1	<0.1
Phenols (ug/L)	20	<1	<1	<1	<1	<1
Zinc (total) (ug/L)	500	<40	<40	<40	<40	<40
Benzene (ug/L)	370	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene (ug/L)	2	<0.5	<0.5	<0.5	<0.5	<0.5
Ethyl benzene (ug/L)	90	<0.5	<0.5	<0.5	<0.5	<0.5

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Attention: Mr. Will Wyman
PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1811301
Date Submitted: 2018-07-04
Date Reported: 2018-07-11
Project: FOX-M
COC #: 197617

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1370307 Water 2018-06-25 XL-W20B-1
General Chemistry	pH	1.00				7.76
Mercury	Hg	0.0001	mg/L			<0.0001
Metals	Aqua-Regia Digest					Y
	As	0.02	mg/L			<0.02
	Zn	0.04	mg/L			<0.04
Oil and Grease	Oil & Grease - Total	1	mg/L			<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L			<0.1
Subcontract-Inorg	Phenols	0.001	mg/L			<0.001
VOCs Surrogates	Toluene-d8	0	%			100
Volatile	Benzene	0.5	ug/L			<0.5
	Ethylbenzene	0.5	ug/L			<0.5
	Toluene	0.5	ug/L			<0.5

Guideline = * = Guideline Exceedance

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 44: HAL W20B berm water laboratory results, page 1 of 2

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Ottawa, ON
K2P 2H8

Attention: Mr. Will Wyman
PO#: 0021060-OT

Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1811303
Date Submitted: 2018-07-04
Date Reported: 2018-07-06
Project: FOX-M
COC #: 197617

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1370310 Water 2018-06-25 XL-W20 B-1
Metals	Cd	0.0001	mg/L		<0.0001	
	Co	0.0002	mg/L		<0.002	
	Cr	0.001	mg/L		<0.001	
	Cu	0.001	mg/L		0.001	
	Ni	0.005	mg/L		<0.005	
	Pb	0.001	mg/L		<0.001	

Figure 45: HAL W20B berm water laboratory results, page 2 of 2

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K2P 2H8
Attention: Mr. Will Wyman
PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 18111304
Date Submitted: 2018-07-04
Date Reported: 2018-07-11
Project: FOX-M
COC #: 192664

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1370311 Water 2018-06-23 XL-W20 D-1
General Chemistry	pH	1.00				7.77
Mercury	Hg	0.0001	mg/L			<0.0001
Metals	Aqua-Regia Digest					Y
	As	0.02	mg/L			<0.02
	Zn	0.04	mg/L			<0.04
Oil and Grease	Oil & Grease - Total	1	mg/L			<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L			<0.1
Subcontract-Inorg	Phenols	0.001	mg/L			<0.001
VOCs Surrogates	Toluene-d8	0	%			101
Volatile	Benzene	0.5	ug/L			<0.5
	Ethylbenzene	0.5	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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Figure 46: HAL W20D&E berm water laboratory results, page 1 of 2

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Attention: Mr. Will Wyman
PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1811305
Date Submitted: 2018-07-04
Date Reported: 2018-07-06
Project: FOX-M
COC #: 192664

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Metals	Cd	0.0001	mg/L	<0.0001	1370312 Water
	Co	0.0002	mg/L	<0.0002	2018-06-23 XL-W20 D-1
	Cr	0.001	mg/L	0.001	
	Cu	0.001	mg/L	0.001	
	Ni	0.005	mg/L	<0.005	
	Pb	0.001	mg/L	<0.001	

Figure 47: HAL W20D&E berm water laboratory results, page 2 of 2

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Attention: Mr. Will Wyman
PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1811306
Date Submitted: 2018-07-04
Date Reported: 2018-07-11
Project: FOX-M
COC #: 197629

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1370313 Water 2018-06-25 XL-W20 F-1
General Chemistry	pH	1.00	mg/L		7.86	
Metals	Hg	0.0001	mg/L		<0.0001	
	Aqua-Regia Digest				Y	
	As	0.02	mg/L		<0.02	
Oil and Grease	Zn	0.04	mg/L		<0.04	
	Oil & Grease - Total	1	mg/L		<1	
	PCBs	0.1	ug/L		<0.1	
Subcontract-Inorg	Polychlorinated Biphenyls (PCBs)	0.001	mg/L		<0.001	
VOCs Surrogates	Phenols					
Volatile	Toluene-d8	0	%		93	
	Benzene	0.5	ug/L		<0.5	
	Ethylbenzene	0.5	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 5

Figure 48: HAL W20F berm water laboratory results, page 1 of 2

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Attention: Mr. Will Wyman
PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1811307
Date Submitted: 2018-07-04
Date Reported: 2018-07-06
Project: FOX-M
COC #: 197629

Lab I.D.
Sample Matrix
Sample Type
Sampling Date
Sample I.D.
1370314
Water
2018-06-25
XL-W20 E-1

Group	Analyte	MRL	Units	Guideline
Metals	Cd	0.0001	mg/L	<0.0001
	Co	0.0002	mg/L	<0.0002
	Cr	0.001	mg/L	<0.001
	Cu	0.001	mg/L	0.002
	Ni	0.005	mg/L	<0.005
	Pb	0.001	mg/L	<0.001

Figure 49: HAL W20F berm water laboratory results, page 2 of 2

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PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1811299
Date Submitted: 2018-07-04
Date Reported: 2018-07-11
Project: FOX-M
COC #: 192665

Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.88
Mercury	Hg	0.0001	mg/L		<0.0001
Metals	Aqua-Regia Digest				Y
	As	0.02	mg/L		<0.02
	Zn	0.04	mg/L		<0.04
Oil and Grease	Oil & Grease - Total	1	mg/L		<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
Subcontract-Inorg	Phenols	0.001	mg/L		<0.001
VOCs Surrogates	Toluene-d8	0	%		98
Volatile	Benzene	0.5	ug/L		<0.5
	Ethylbenzene	0.5	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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Figure 50: HAL W22A berm water laboratory results, page 1 of 2

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PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1811300
Date Submitted: 2018-07-04
Date Reported: 2018-07-06
Project: FOX-M
COC #: 192665

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1370306 Water 2018-06-23 XL-W22 A-1
Metals	Cd	0.0001	mg/L		<0.0001	
	Co	0.0002	mg/L		<0.0002	
	Cr	0.001	mg/L		<0.001	
	Cu	0.001	mg/L		0.001	
	Ni	0.005	mg/L		<0.005	
	Pb	0.001	mg/L		<0.001	

Figure 51: HAL W22A berm water laboratory results, page 2 of 2

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PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1811297
Date Submitted: 2018-07-04
Date Reported: 2018-07-11
Project: FOX-M
COC #: 192666

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1370303 Water 2018-06-23 XL-W22 B-1
General Chemistry	pH	1.00				7.85
Mercury	Hg	0.0001	mg/L			<0.0001
Metals	Aqua-Regia Digest					Y
	As	0.02	mg/L			<0.02
	Zn	0.04	mg/L			<0.04
Oil and Grease	Oil & Grease - Total	1	mg/L			<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L			<0.1
Subcontract-Inorg	Phenols	0.001	mg/L			<0.001
VOCs Surrogates	Toluene-d8	0	%			100
Volatiles	Benzene	0.5	ug/L			<0.5
	Ethylbenzene	0.5	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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Figure 52: HAL W22B berm water laboratory results, page 1 of 2

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400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 0021060-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1811298
Date Submitted: 2018-07-04
Date Reported: 2018-07-06
Project: FOX-M
COC #: 192666

Lab I.D.
Sample Matrix
Sample Type
Sampling Date
Sample I.D.

1370304
Water
2018-06-23
XL-W22 B-1

Group	Analyte	MRL	Units	Guideline
Metals	Cd	0.0001	mg/L	<0.0001
	Co	0.0002	mg/L	<0.0002
	Cr	0.001	mg/L	<0.001
	Cu	0.001	mg/L	0.004
	Ni	0.005	mg/L	<0.005
	Pb	0.001	mg/L	<0.001

Figure 53: HAL W22B berm water laboratory results, page 2 of 2

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