



2015 ANNUAL NUNAVUT WATER BOARD REPORT FOR FOX-3

FOR THE North Warning System

Contract # W8485-100224/001/NX
CDRL 16.F.5.d

Document Number
FM-EHS-13, Rev 1, 17-Mar-2016

Prepared for
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CHANGE HISTORY

This sheet is a record of each issue of this document. When the revised document is issued, the previous issue is automatically superseded.

Version	Date	Configuration Management	Pages Changed	Reason for Change
1	17-Mar-2016	-	-	Initial Document Release.
Document Title: 2015 Annual Nunavut Water Board Report for FOX-3				Document Number: FM-EHS-13

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EXECUTIVE SUMMARY

This 2015 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-FOD0919 – Type “B”, Part B. General Conditions, paragraph 1. This report covers 01 January to 31 December 2015.

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 at Dewar Lakes, Nunavut. The site is visited quarterly for preventive maintenance inspections and as required for other work by RCL staff from FOX-M, Hall Beach, Nunavut.

A total of 378.7 cubic meters was drawn from the water supply lake. This is below the annual maximum of 1,440 cubic meters allowed by the licence.

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

Hazardous waste was removed from CAM-M for disposal outside of Nunavut. The waste went to Safety Kleen, 2730 boulevard Industriel, Chambly, QC, J3L 4V2. The hazardous waste consisted of 10 drums of assorted waste (oil, fuel, paint, etc.) and 2 crates of fire extinguishers.

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

No outdoor spills occurred at FOX-3 in 2015.



SOW REF: 16.F.5.d

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1.0 INTRODUCTION

This 2015 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-FOD0919 – Type “B”, Part B. General Conditions, paragraph 1. This report covers the period from 01 January to 31 December 2014.

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 for preventive maintenance inspections and as required for other work by RCL staff from FOX-M, Hall Beach, Nunavut.

1.1 REPORT DETAILS

Licensee: Department of National Defence, Government of Canada

Licence: 3BC-FOD0919 – Type “B”

Location: FOX-3 North Warning System Site,
Dewar Lakes, Qikiqtani Region, Nunavut

Report prepared by: Raytheon Canada Limited, 17-Mar-2016

Time Period Covered: 01 January to 31 December 2015

2.0 WATER USE

A total of 378.7 cubic meters was drawn from the water supply lake. This is below the annual maximum of 1,440 cubic meters allowed by the licence. See Table 2-1 for the volume of raw water drawn.

Table 2-1 Monthly Raw Water Usage at FOX-3 in 2015

Month	Raw water usage in cubic metres (m ³)
January	0
February	36.1
March	0
April	0
May	0
June	33.6
July	127.2
August	147.5
September	0
October	34.4
November	0
December	0
TOTAL	378.7

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3.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

As FOX-3 is a landlocked site, all waste Hazardous Waste and Waste Oil is transported to FOX-M before being shipped to an approved hazardous waste disposal site outside of Nunavut as required by the licence. The hazardous waste was shipped to Safety Kleen, 2730 boulevard Industriel, Chambly, QC, J3L 4V2.

See **Error! Reference source not found.** for the list of items sent for disposal.

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

Table 3-1 Hazardous Waste and Waste Oil Sent for Disposal from FOX-3 in 2015

Site	Description, TDG shipping name	Quantity	Movement Document or Manifest #
FOX-3	Fire Extinguishers	2 Crates	NWS Manifest 34297
FOX-3	Waste Jet A1 Fuel and Water Mixture Waste Fuel, Aviation, Turbine Engine Mixture	1 Drum	NWS Manifest 34298
FOX-3	Waste Jet A1 Fuel Filters Waste Solids Containing Flammable Liquid, N.O.S. (Fuel, Aviation, Turbine Engine)	1 Drum	NWS Manifest 34297
FOX-3	Waste Jet A1 Fuel Impacted Soil Waste Solids Containing Flammable Liquid, N.O.S. (Fuel, Aviation, Turbine Engine)	2 Drums	NWS Manifest 34298
FOX-3	Waste Oil Not TDG Regulated	6 Drums	NWS Manifest 34296
FOX-3	Waste Paint	1 Crate	NWS Manifest 34302

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. See **Annex B** for the location of the landfill with co-ordinates.

Table 4-1 Non-hazardous Domestic Solid Waste Sent for Disposal from FOX-3 in 2015

Month	Waste Generated (kg)
January	249.5
February	215.5
March	43.5
April	0
May	0

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Month	Waste Generated (kg)
June	183.7
July	7189.4
August	0
September	0
October	0
November	0
December	0
Total	7,882

5.0 MONITORING PROGRAM

See **Annex C** for the location of the sewage effluent outfall, FOD-2, with co-ordinates. A sump for the sewage outfall was built in 2010.

See **Annex D** is blank. The sump for the sewage outfall was not pumped out therefore no samples were taken for laboratory analysis.

See **Annex E** for the list of bermed fuel storage facilities, FOD-3, with co-ordinates.

See **Annex F** for analysis of berm water (water contained in the berms of fuel storage facilities). The results were confirmed to be within effluent quality limits of the NWB licence 3BC-FOD0919, Part D, item 10 before the water was pumped out of the berms.

6.0 SPILLS (UNAUTHORIZED DISCHARGES)

Four outdoor spills occurred. See Table 6-1 for details.

Table 6-1 Outdoor Spills Reported at FOX-3 in 2015

Date, Spill #	Product	Quantity	Cause and follow-up action	Location on-site
No outdoor spills occurred at FOX-3 in 2015.				



7.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

No changes to the Spill Contingency Plan in 2015.

8.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

None undertaken.

Two spills occurred on-site in past years that still require remediation, one near the summit and one along the pipeline from the apron to the summit. These spills will be delineated in summer 2016 so that an appropriate scope can be determined for their clean-up. There are Intermediate Bulk Containers (IBCs) that contain impacted soils at each spill site. These IBCs will be moved to a suitable storage location on-site in 2016.

9.0 ACRONYMS

Acronym	Definition
CC&C	Care, Custody, and Control
DEG	Diesel Engine Generator
DND	Department of National Defence
NWB	Nunavut Water Board
NWS	North Warning System
NWSO	North Warning System Office
O&M	Operations and Maintenance
PCB	Polychlorinated Biphenyl
RCL	Raytheon Canada Limited
TDGR	Transportation of Dangerous Goods Regulations



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ANNEX A - FOX-3 - HAZARDOUS WASTE AND WASTE OIL DISPOSAL IN 2015



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: RDUBEAU		Date: Jul 14, 2015 3:57 PM		TCN-34296			
Ship To: 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		From: 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		Priority 2			
Attention:		Attention:					
Carrier:		Routing: YUW/YUX		Waybill #: Total Pcs. Total Weight: 2 pcs 2500 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	PALLET	800 LBS				F3-11850	WASTE OIL (NON-REGULATED) 48 X 40 X 44 PALLET#7 EIN 318193,318194
1	PALLET	1700 LBS				F3-11850	WASTE OIL (NON-REGULATED) 48 X 46 X 43 PALLET#6 EIN 331427,331428,331426,171470
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.							
				Received By:		Date	
				Received By:		Date	

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Canada Limited

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SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: RDUBEAU		Date: Jul 14, 2015 4:27 PM		TCN-34297			
Ship To: 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		From: 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		Priority 2			
Attention:		Attention:					
Carrier:		Routing: YUW/YUX		Waybill #:			
				Total Pcs. 3 pcs			
				Total Weight: 1950 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	CRATE	900 LBS			EIN 131617	F3-11848	WASTE FIRE EXTINGUISHER (UN 1044) 55 X 46-1/2 X 67 CRATE#17
1	CRATE	900 LBS			EIN 131616	F3-11848	WASTE FIRE EXTINGUISHER (UN 1044) 65 X 48 X 65 CRATE#18
1	PALLET	150 LBS			EIN 322587	F3-11848	WSTE FUEL FILTERS (UN 3175) 47 X 40 X 44 PALLET#15
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.							
				Received By:		Date	
				Received By:		Date	



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: RDUBEAU		Date: Jul 14, 2015 4:39 PM		TCN-34298			
Ship To: 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		From: 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		Priority 2			
Attention:		Attention:					
Carrier:		Routing: YUW/YUX		Waybill #:			
				Total Pcs. 3 pcs			
				Total Weight: 2900 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	PALLET	1200 LBS				F3-11851	WASTE WATER FUEL (UN 1883) 48 X 40 X 44 PALLET#8
1	PALLET	1100 LBS			EIN 303019	F3-11851	WASTE FUEL SOIL (UN 3175) 36 X 32 X 42 PALLET#9
1	PALLET	600 LBS			EIN 326299	F3-11851	WASTE FUEL SOIL (UN3175) 36 X 32 X 42 PALLET#11
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.							
				Received By:		Date	
				Received By:		Date	

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SHIPPING MANIFEST

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

NON NEGOTIABLE

Filed By: RDUBEAU	Date: Jul 15, 2015 2:32 PM	TCN-34302
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Ship To: 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	From: 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	Priority 2
---	--	----------------------

Attention:		Attention:	
Carrier:	Routing: YUW/YUX	Waybill #:	Total Pcs: 19 pcs
			Total Weight: 27035 LBS

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	CRATE	1300 LBS					SCRAP METAL (EPRP) 80-1/2 X 45 X 35 CRATE#1
1	CRATE	2000 LBS					SCRAP WOOD/METAL 101 X 72-1/2 X 88 CRATE#23
1	CRATE	1900 LBS					SCRAP WOOD/METAL 72 X 48 X 56 CRATE#26
1	CRATE	650 LBS					SCRAP WOOD 91 X 34 X 27-1/2 CRATE#29
1	CRATE	2100 LBS					SCRAP METAL 72 X 48 X 57 CRATE#34
1	PALLET	210 LBS					EMPTY METAL DRUMS 48 X 36 X 42 PALLET#27
1	PALLET	210 LBS					EMPTY METAL DRUMS 48 X 36 X 42 PALLET#28
1	CRATE	1550 LBS					WASTE PAINT (UN 1283) 71 X 57 X 47 CRATE#3
1	CRATE	1900 LBS					SCRAP METAL 89 X 46 X 38 CRATE#5
1	CRATE	1000 LBS					SCRAP WIRE 96 X 46 X 38 CRATE#6
1	CRATE	1200 LBS					SCRAP METAL 72 X 48 X 56 CRATE#8
1	CRATE	1000 LBS					GARBAGE 72 X 48 X 58 CRATE#10
1	CRATE	1000 LBS					SCRAP METAL 44-1/2 X 52 X 37 CRATE#11
1	CRATE	4885 LBS					CEMENT BAGS (OLD) 96 X 50 X 53 CRATE#12
1	PALLET	600 LBS					WOOD PANELS 78 X 44 X 25 PALLET#18
1	CRATE	1500 LBS					SCRAP WOOD/MEATL 96 X 48 X 54 CRATE#19
1	CRATE	1750 LBS					SCRAP WOOD/METAL 96 X 48 X 54 CRATE#20
1	CRATE	1800 LBS					SCRAP WOOD/METAL 116 X 50 X 25-1/2 CRATE#21
1	CRATE	2350 LBS					SCRAP WOOD/METAL 104-1/2 X 54 X 42 CRATE#22

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

Received By:	Date
Received By:	Date

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ANNEX B - FOX-3 - LOCATION OF LANDFILL WITH COORDINATES



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

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ANNEX C - FOX-3 - SEWAGE OUTFALL LOCATION (FOD-2) WITH COORDINATES



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

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ANNEX D - FOX-3 - ANALYSIS OF SEWAGE EFFLUENT

The sump of the sewage outfall was not pumped out therefore no samples were taken for laboratory analysis. This Annex has been left blank because there are no results to report.



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ANNEX E - FOX-3 - LOCATION OF BERMED FUEL STORAGE FACILITIES WITH COORDINATES

Licence	Location	Monitoring Station # (Final discharge point of bermed fuel storage facility)	Berm's location on-site	Berm's coordinates
3BC- FOD0919 Type "B"	FOX-3 North Warning System Site, Dewar Lakes, Qikiqtani Region, Nunavut	FOD-3	Summit (near helipad), berm of tanks W22A and W22B	68° 39' 05" N 71° 14' 03" W
			Summit (behind warehouse), berm of tanks W22C and W22D	68° 39' 04" N 71° 13' 50" W
			Airfield, berm of tanks W20D and W20E	68° 37' 25" N 71° 08' 06" W

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ANNEX F - FOX-3 - ANALYSIS OF BERM WATER (EFFLUENT FROM BERMED FUEL STORAGE FACILITIES)

Table E-1 Analysis of Berm Water at FOX-3 in 2015

Berm Date	Maximum Concentration of any Grab Sample (µg/L)	W22A & W22B 30-Jun-15	W22C & W22D 30-Jun-15	W20D & W20E 30-Jun-15
pH	6 to 9	6.43	6.96	6.41
Oil and Grease (ug/L)	5000	<1000	2000	<1000
Arsenic (total) (ug/L)	100	<20	<20	<20
Cadmium (dissolved) (ug/L)	10	0.1	1.1	0.2
Chromium (dissolved) (ug/L)	100	<1	<1	<1
Cobalt (dissolved) (ug/L)	50	1	1.3	1.3
Copper (dissolved) (ug/L)	200	2	7	4
Lead (dissolved) (ug/L)	50	<1	<1	<1
Mercury (total) (ug/L)	0.6	<0.1	<0.1	<0.1
Nickel (dissolved) (ug/L)	200	<5	10	15
PCB (total) (ug/L)	1000	<0.1	<0.1	<0.1
Phenols (ug/L)	20	<2	<2	<2
Zinc (total) (ug/L)	500	120	<40	120
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

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30Jun2015

Summit (near helipad), berm of tanks W22A and W22B

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EXOVA ENVIRONMENTAL ONTARIO

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: 1512831
Date Submitted: 2015-07-08
Date Reported: 2015-07-13
Project: Fox-3-15-00344-OT
COC #: 130439

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Group	Analyte	MRL	Units	Guideline	1187053 Water 2015-06-30 F3-W22A/W22B Berm
Metals	Cd	0.0001	mg/L		0.0001
	Co	0.0002	mg/L		0.0010
	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

Guideline = * = Guideline Exceedence
All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).
Results relate only to the parameters listed on the samples submitted.
Methods references and/or additional QA/QC information available on request.

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

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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SOW REF: 16.F.5.d

30Jun2015

Summit (near helipad), berm of tanks W22A and W22B

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EXOVA ENVIRONMENTAL ONTARIO

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: 1512832
Date Submitted: 2015-07-08
Date Reported: 2015-07-16
Project: Fox-3-15-00344-OT
COC #: 130439

Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.				
1187054 Water 2015-06-30 F3-W22A/W22B Berm				
Group	Analyte	MRL	Units	Guideline
General Chemistry	pH	1.00		6.43
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	0.12
Oil & Grease	Oil & Grease - Total	1.0	mg/L	<1.0
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	<0.1
Phenols-4AAP	Phenols	0.002	mg/L	<0.002
VOCs	Benzene	0.5	ug/L	<0.5
	Ethylbenzene	0.5	ug/L	<0.5
	Toluene	0.5	ug/L	<0.5
VOCs Surrogates (%)	Toluene-d8	0	%	98

Guideline = * = Guideline Exceedence
All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).
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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SOW REF: 16.F.5.d

30Jun2015

Summit (behind warehouse), berm of tanks W22C and W22D

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EXOVA ENVIRONMENTAL ONTARIO

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: 1512754
Date Submitted: 2015-07-08
Date Reported: 2015-07-13
Project: Fox-3-15-00344-OT
COC #: 132969

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1186871 Water 2015-06-30 F3-W22C/W22D Berm
Group	Analyte	MRL	Units	Guideline	
Metals	Cd	0.0001	mg/L		0.0011
	Co	0.0002	mg/L		0.0013
	Cr	0.001	mg/L		<0.001
	Cu	0.001	mg/L		0.007
	Ni	0.005	mg/L		0.010
	Pb	0.001	mg/L		<0.001

Guideline = * = Guideline Exceedence
All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).
Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.
146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

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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30Jun2015

Summit (behind warehouse), berm of tanks W22C and W22D

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EXOVA ENVIRONMENTAL ONTARIO

Certificate of Analysis



Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1512756
Date Submitted: 2015-07-08
Date Reported: 2015-07-16
Project: Fox-3-15-00344-OT
COC #: 132989

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1186873 Water 2015-06-30 F3-W22C/W22D Berm
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			6.96
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		0.06
Oil & Grease	Oil & Grease - Total	1.0	mg/L		2.0
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
Phenols-4AAP	Phenols	0.002	mg/L		<0.002
VOCs	Benzene	0.5	ug/L		<0.5
	Ethylbenzene	0.5	ug/L		<0.5
	Toluene	0.5	ug/L		0.5
VOCs Surrogates (%)	Toluene-d8	0	%		100

Guideline = * = Guideline Exceedence
All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).
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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SOW REF: 16.F.5.d

30Jun2015

Airfield, berm of tanks W20D and W20E

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EXOVA ENVIRONMENTAL ONTARIO

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: 1512829
Date Submitted: 2015-07-08
Date Reported: 2015-07-13
Project: Fox-3-15-00344-OT
COC #: 128318

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1187051 Water 2015-06-30 Fox-3-15-00344-OT
Group	Analyte	MRL	Units	Guideline	
Metals	Cd	0.0001	mg/L		0.0002
	Co	0.0002	mg/L		0.0013
	Cr	0.001	mg/L		<0.001
	Cu	0.001	mg/L		0.004
	Ni	0.005	mg/L		0.015
	Pb	0.001	mg/L		<0.001

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

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Airfield, berm of tanks W20D and W20E

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EXOVA ENVIRONMENTAL ONTARIO

Certificate of Analysis



Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1512830
Date Submitted: 2015-07-08
Date Reported: 2015-07-16
Project: Fox-3-15-00344-OT
COC #: 128318

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Group	Analyte	MRL	Units	Guideline	1187052 Water 2015-06-30 F3W20D/W20E Berm
General Chemistry	pH	1.00			6.41
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		0.12
Oil & Grease	Oil & Grease - Total	1.0	mg/L		<1.0
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
Phenols-4AAP	Phenols	0.002	mg/L		<0.002
VOCs	Benzene	0.5	ug/L		<0.5
	Ethylbenzene	0.5	ug/L		<0.5
	Toluene	0.5	ug/L		<0.5
VOCs Surrogates (%)	Toluene-d8	0	%		96

Guideline = * = Guideline Exceedence
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