2020 Annual Report for CFS Alert, Nunavut

Prepared for:
Nunavut Water Board

Licensee:
RP Ops Group North
Department of National Defence

Prepared & Submitted by:
8 Wing Environmental Management,
8 Wing Trenton,
Department of National Defence

31 March 2021

Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut, X0B 1J0

Attention: Manager of Licensing

Subject: 2020 Annual Report for CFS Alert, Nunavut

Please find enclosed a copy of the 2020 Annual Report to the Nunavut Water Board and Executive Summary in English and Inuktitut for the following site:

1. Canadian Forces Station (CFS) Alert – 8AC-ALT1929 Type "A"

The Annual Report is being submitted by the Department of National Defence at 8 Wing/Canadian Forces Base Trenton on behalf of the licensee, the Department of National Defence at RP Ops N- ADM (IE).

As see around the world, due to the COVID -19 world pandemic this past year saw reduced reporting capabilities on Station and consequently limited/reduced data collection associated with the Water Licence.

Should the Nunavut Water Board have comments or require additional information regarding the Annual Report, please contact Mr. Nathan Koutroulides, 8 Wing Deputy Environment Officer, 8 Wing Environmental Management at (613) 392-2811 x4821 or by e-mail at: Nathan.Koutroulides@forces.gc.ca.

Sincerely,

Nathan Koutroulides, B.Sc, CD, PMP.
8 Wing Deputy Environment Officer, Environmental Management
Department of National Defence / Government of Canada
Nathan.Koutroulides@forces.gc.ca / Tel: 613-392-2811 Ext. 4821

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Table of Contents

2020 Annual Report to the Nunavut Water Board

Licensee: Department of National Defence – RP Ops - ADM (IE)
Licence: 8AC-ALT1929 Type "A", (formerly 3BC-ALT1015 Type "B")
Location: Canadian Forces Station Alert, Ellesmere Island, Qikiqtani Region, Nunavut.

Report submitted by: Department of National Defence – 8 Wing/Canadian Forces Base Trenton – 8 Wing Environmental Management,
31 March 2021

Executive Summary

The 2020 annual report to the Nunavut Water Board (NWB) is a requirement under Licence Number 8AC-ALT1929 Type "A", Part B, Paragraph 1. This annual report is for Canadian Forces Station (CFS) Alert, Nunavut. The Licence was issued on November 1st, 2019, to the Department of National Defence (DND) Real Property Operations North (RP Ops N) - Assistant Deputy Minister of Infrastructure & Environment (ADM(IE)). As 8 Wing – Canadian Forces Base (CFB) Trenton, Ontario, oversees CFS Alert, 8 Wing Trenton is filing the annual report on behalf of the new DND licensee, Real Property Operations North (RP Ops N) - Assistant Deputy Minister of Infrastructure & Environment (ADM(IE)). This is the first submission under the new Licence conditions.

For 2020, the average daily water usage at CFS Alert was 565 m^3. This usage is below the 875 cubic meters daily water usage allowed by the NWB Licence. The daily water usage amount being reported is slightly less than the daily intake amount of raw water from the source at Upper Dumbell Lake. A large portion of this usage water is directly returned (raw and untreated) to the source concurrently to the intake process, the average return amount was 563 m^3/day. This constant circulatory (return) flow of the raw water prevents freezing damages to the water pipelines. The average daily water consumption amount was 72 m^3. The total annual quantity of water used in 2020 was 201,615 m^3.

Hazardous wastes (batteries, hazardous liquids, asbestos) were backhauled from CFS Alert in 2020 for disposal outside of Nunavut in Ontario, by external contractors. Non-hazardous domestic wastes produced from CFS Alert were directed to the designated Main Station Landfill. Annual repairs to the sewage terrace system were completed in the spring of 2020. All sewage were directed to the Sewage Terrace System.

As seen around the world, due to the COVID-19 World Pandemic CFS Alert support crew were reduced with no visitor allowed on station in order to prevent unwanted spread/transmission at the Station. As such, the environmental sampling and support crew were unable to attend the station in 2020. Consequently, the sampling requirements for the 2020 CFS Alert Surveillance Network Program were severely impacted and reduced with only one sampling event taken. DND maintains a positive commitment to demonstrating compliance to the NWB Licence and is

planning to restore the CFS Alert Surveillance Network Program capabilities in Summer 2021 and/or once Territorial restrictions are lifted.

2020 ᐊᕐᕌᒍᑕᒫᖅᓯᐅᑦ ᐅᓂᒃᑳᖅ ᑐᕌᖅᑐᖅ ᓄᓇᕗᒻᒥ ᐃᒪᕐᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ

ᓛᓴᓐᓯᖃᖅᑎᑕᐅᔪᖅ: ᐱᓕᕆᕕᖕᒐ ᑲᓇᑕᒥ ᓴᐳᓐᓂᐊᑎᒃᑯᑦ – RP Ops - ADM (IE)
ᓚᐃᓴᓐᓯ: 8BC-ERK1621 ᓱᓇᐅᓂᖓ “A” (ᐃᒪᐃᑦᑐᒥᓂᐅᒐᓗᐊᖅ 3BC-ALT1015 ᓱᓇᐅᓂᖓ “B”)
ᐃᓂᖓ: ᑲᓇᑕᒥ ᖃᐅᔨᓴᖅᑏᑦ ᐱᓕᕆᕕᖕᒐ ᐃᐅᕇᑲ, ᐊᐅᓯᐃᑦᑑᑉ ᕿᑭᖅᑖᓗᐊ, ᕿᑭᖅᑕᓂ, ᓄᓇᕗᑦ.

ᐅᓂᒃᑳᖅ ᑐᓂᔭᐅᔪᖅ ᐅᑯᓇᙵᑦ: ᐱᓕᕆᕕᖕᒐ ᑲᓇᑕᒥ ᓴᐳᓐᓂᐊᑎᒃᑯᑦ –
8 ᑎᖕᒥᔫᖅ/ᑲᓇᑕᒥ ᓴᐳᓐᓂᐊᑎᒃᑯᑦ ᑎᖕᒥᔫᖃᕐᕕᖓ ᑐᕆᐊᓐᑕᓐ –
8 ᑎᖕᒥᔫᖅ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ ᐊᐅᓚᑦᓯᔪᑦ,
31 ᒫᑦᓯ 2021

ᐊᐅᓚᑦᓯᔨᐅᑦ ᓈᐃᓈᖅᓯᒪᔭᖓ

ᑖᓐᓇ 2020 ᐊᕐᕌᒍᑕᒫᖅᓯᐅᑦ ᑐᕌᖅᑐᖅ ᓄᓇᕗᒻᒥ ᐃᒥᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ ᐱᔭᕆᐊᓕᒃ ᒪᓕᓪᓗᒍ ᓄᑕᐅᓯᖅᑕᐅᓯᒪᔪᖅ ᓚᐃᓴᓐᓯ ᓈᓴᐅᑎᓕᒃ 8AC-ALT1929 ᓱᓇᐅᓂᖓ “A”, ᐃᓚᖓ B, ᑎᑎᕋᖅᓯᒪᓂᖓ ᐅᓂᑳᖅᑐᖅ 1. ᐅᓇ ᐊᕐᕌᒍᑕᒫᖅᓯᐅᑦ ᐅᓂᒃᑳᖅ ᐅᑯᓄᙵᖓᔪᖅ ᑲᓇᑕᒥ ᖃᐅᔨᓴᖅᑏᑦ ᑎᖕᒥᔫᒃᑯᑦ ᐱᓕᕆᕕᖕᒐ (CFS) ᐃᐅᕇᑲ, ᓄᓇᕗᑦ. ᑖᓐᓇ ᓚᐃᓴᓐᓯ ᑐᓂᔭᒥᓂᖅ ᓅᕙᐃᒻᕙ 1−ᖑᑎᓪᓗᒍ, 2019, ᑲᓇᑕᒥ ᑎᖕᒥᔫᒃᑯᑦ ᓴᐳᓐᓂᐊᖅᑎᒃᑯᓐᓄᑦ ᐊᒻᒪᓗ ᓄᓇᕐᑯᑎᖃᖅᑐᓄᑦ ᐊᐅᓚᑦᓯᔪᓄᑦ ᐅᑭᐅᖅᑕᖅᑐᒥ (RP Ops N) - ᑐᖕᒋᓕᖓ ᐃᑲᔪᖅᑎ ᒥᓂᔅᑕᐅᑉ ᓴᓇᒋᐊᓕᓐᓄᑦ ᐊᒻᒪᓗ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ (ADM(IE)). 8 ᑎᖕᒥᔫᖅ – ᑲᓇᑕᒥ ᓴᐳᓐᓂᐊᑎᒃᑯᑦ ᐃᓂᖓ (CFB) ᑐᕆᐊᓐᓇᓐᒥ, ᐋᓐᑎᐅᕆᔭ, ᑲᒪᖕᒋᔭᓕᒃ ᑲᓇᑕᒥ ᑎᖕᒥᔫᒃᑯᑦ ᓴᐳᓐᓂᐊᖅᑎᓂᑦ ᐃᐅᕇᑲ, 8 ᑎᖕᒥᔫᖅ ᑐᕆᐊᓐᑕᓐ ᑐᓂᓯᔪᖅ ᑎᑎᕋᖅᑕᐅᓯᒪᔪᕐᑯᑕᐅᔫᓃᓐᓂᐊᑎᓪᓗᒍ ᐊᕐᕌᒍᑕᒫᖅᓯᐅᒻᒥᒃ ᐅᓂᒃᑲᒥᒃ ᑭᓪᒧᖅᓱᒍ ᓄᑖᖅ DND ᓚᐃᓴᓐᓯᖃᖅᑎᑕᐅᔪᓄᑦ, ᓇᒻᒥᓂᖃᖅᑎᐅᔪᑦ ᐊᐅᓚᑕᐅᓂᖏᑦ ᐅᑭᐅᖅᑕᖅᑐᒥ (RP Ops N) - ᑐᖕᒋᓕᖓ ᐃᑲᔪᖅᑎ ᒥᓂᔅᑕᐅᑉ ᓴᓇᒋᐊᓕᓐᓄᑦ ᐊᒻᒪᓗ ᐊᕙᑎᓕᕆᓂᕐᒧᑦ (ADM(IE)). ᑖᓐᓇ ᓯᕗᓪᓕᖅᐹᖅ ᑐᓂᔭᐅᓂᖓᑕ ᒪᓕᓪᓗᒍ ᓄᑖᖅ ᓛᐃᓴᓐᓯᒧᑦ ᐊᑐᕆᐊᓖᑦ.

2020−ᒧᑦ, ᖃᐅᑕᒫᑦ ᐃᒥᖅᑐᓂᕐᒧᑦ ᐊᑐᖅᑕᐅᒐᔪᑦᑐᖅ CFS ᐊᓖᑦᒥ ᐃᒪᓐᓇᒥᓂᖅ 565 ᒦᑕᐃᑦ^3. ᑕᒪᓐᓇ ᐃᒥᖅᑐᕐᓂᖅ ᐊᑖᓂᑦᑐᖅ 875 ᑭᑉᐹᓇᑦᑎᓪᓗᒋᑦ ᒦᑕᐃᑦ ᖃᐅᑕᒫᑦ ᐃᒥᖅᑐᕈᑎ ᐱᔪᓇᖅᑎᑕᐅᒍᑎᖓᑦ ᓄᓇᕗᒻᒥ ᐃᒥᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᑕ ᓚᐃᓴᓐᓯᐅᑉ. ᖃᐅᑕᒫᑦ ᐃᒥᖅᑐᕈᑎᒧᑦ ᑲᑎᓪᓗᒍ ᐅᓂᒃᑳᖑᔪᖅ ᓯᕐᓚᕈᓗᒃ ᒥᑭᓂᖅᓴᖅ ᖃᐅᑕᒫᑦ ᐃᒥᖅᑐᕈᑎᐅᑉ ᐃᒥᕐᓂᐊᕐᓗᓂ ᓱᕐᕋᑦᓯᒪᙱᑦᑐᒥᒃ ᐃᒥᑐᐃᓐᓇᕐᒥᒃ ᖁᑦᓯᓂᖅᓴᒥᙶᖅᑐᒥᒃ ᑕᒻᐱᐅᓪ ᑕᓯᙵᑕ. ᐃᒥᖅ ᐃᒪᖅᑐᓂᖅᓴᖅ ᐊᑐᖅᑕᐅᕙᓪᓕᐊᓂᖓ ᐅᑎᖅᑎᑕᐅᕙᑦᑐᖅ (ᓱᕐᕋᑦᓯᒪᙱᑦᑐᖅ ᐊᒻᒪᓗ ᐃᓚᐅᖅᑐᖅᓯᒪᙱᑦᑐᖅ) ᑕᕗᖓ ᐃᒥᖅᑕᐅᕙᓂᐊᓄᑦ, ᐊᖏᓂᖓ ᐅᑎᖅᑎᑕᐅᕙᑦᑐᖅ ᑲᑎᓪᓗᒋᑦ ᐃᒪᓐᓇᒥᓃᑦ 563 ᒦᑕᐃᑦ^3/ᐅᓪᓗᖅ. ᑕᒪᓐᓇ ᐊᐅᓚᐃᓐᓇᖅᑐᖅ ᐅᑎᖅᑕᖅᑐᖅ (ᐅᑎᖅᐸᑦᑐᖅ) ᐃᖏᕐᕋᓂᖓᓄᑦ ᓱᕐᕋᐃᑦᑐᖅ ᐃᒥᖅ ᖁᐊᔅᓴᐃᒃᑯᑕᐅᕙᒻᒪᑦ ᓱᖃᔅᓴᐃᒃᑯᑕᐅᓪᓗᓂᓗ ᐃᒥᕐᒧᑦ ᓱᓪᓗᓂᓐᓄᑦ. ᖃᐅᑕᒫᑦ ᖑᒥᖅᑐᕈᑎ ᐃᒪᓐᓇᒥᓂᖅ 72 ᒦᑕᐃᑦ^3. ᑲᑎᓪᓗᒋᑦ ᐊᕐᕌᒎᑕᒫᖅ ᐊᖏᓂᖓᑕ ᐃᒥᐅᑉ ᐊᑐᖅᑕᒥᓂᖅ 2020−ᖑᑎᓪᓗᒍ ᐃᒪᓐᓇᒥᓂᖅ 201,615 ᒦᑕᐃᑦ^3.

ᓱᑭᖅᓗᓂᑦ ᐃᖏᑕᐅᕙᓪᓕᑦ (ᐸᑕᓕᒥᓂᑦ, ᓱᑭᖅᓗᓂᑦ ᖃᓄᖅᑐᑦ, ᐊᑦᐱᐊᑦᓱᑕᓂᑦ ᐅᓗᓇᐊᓚᖅᑐᑦ) ᖁᓕᑕᒥᓂᑦ CFS ᐊᔪᖏᑎᒃ 2020-ᖃᐅᓵᓗᔪ ᐃᓕᑕᐅᓄᐊᖏᒪᑕ ᓱᓚᑕᓐᓄᑦ ᓄᓇᕗᑦ ᐊᒃᑎᐅᐅᓇᔾᔪᑎᑦ ᐃᓕᑕᐅᔨᖅᑐᖅᓱᓂᒃ, ᓱᓚᑕᔪᑦ ᑲᓐᑐᖅᓴᓐᓄᓄᑦ. ᐅᓗᓇᐊᓚᖅᑐᖅᖃᓕᑕᑐᑦ ᑭᓱᑐᐃᓪᓚᐃᑦ ᐃᓕᓴᑐᓴᑦ CFS ᐊᔪᓱᒻᒧᖅᑐᑦ ᐊᐅᓪᓚᖅᑎᑕᒥᓂᑦ ᑐᓴᐃᓪᓚᖅᑐᒥᒃ ᐱᓕᓇᕐᐅᓪᓕ ᐊᑦᑕᖅᓴᖏᓐᓄᑦ. ᐊᖅᑭᒍᑦᓯᓚᖅᑐᑦ ᐱᓕᓇᕐᐅᓪᓕ 2020. ᑭᓇᓗᑦ ᑐᓴᐃᓪᓚᖅᑐᒥᒃ ᐃᓕᑕᐅᕙᓪᓕᓱᑎᒃ ᑭᓇᓗᖅᓴᖏᐅᓪᓕ ᐊᖅᑯᓂᖅᑐᑦ.

ᑕᑯᐅᑭᒪᓚᓪᓕᑦ ᓄᓇᖅᓯᐊᒥ, ᐱᓵᔪᑎᑎᓪᓗᔪ ᓄᓕᐅᔪᖅᓇᖅ-19-ᒧᑦ ᓄᓇᖅᓯᐊᒥ ᖁᓂᒪᓪᓇᖅ CFS ᐊᔪᑦ ᐃᑲᔪᖅᑎᖏᑦ ᐃᖅᑲᓇᐃᔾᖅᑎᑦ ᐃᓄᐃᓴᓪᓕᖅᑕᒥᐅᑦ ᑕᕐᓂᓚᖅᑐᖅᑕᒥᓂᑦ ᐃᓄᐃᓴᓪᓕᖅᑎᑕᐅᓂᓗ ᐱᓕᓇᐅᐅᓯᒪᓚᑦ ᖃᐱᓗᐊᖅᑐᖅᑎᑦ ᑲᓇᑕᖅᑐᖅᑕᒥᓂᑦ/ᐊᐃᑦᑐᖅᓗᐃᓂᖅ ᐱᓕᓇᕐᓚᒥ. ᑕᐃᒪᐃᓪᓂᖅᓄᓂᑦ, ᐊᕕᑎᓕᓇᓂᑲᑦ ᖁᐅᓴᓴᑎᖁᓕᓂᖅ ᐊᒥᓚᓗ ᐃᑲᔪᓇᐊᖅᐸᑦᑐᑦ ᐃᖅᑲᓇᐃᔾᖅᑎᑦ ᐅᐸᔪᑎᔨᓇᓂᖅᓯᒪᓚᖅᑐᑦ ᐱᓕᓇᕐᓚᒧᑦ 2020-ᒥ. ᑕᐃᒪᐃᓪᓂᖅᓄᓂᑦ, ᖁᐅᓴᓴᕐᓴᓂᑦ ᐱᓴᓇᐊᓕᑦ 2020-ᒥ CFS ᐊᔪᑦ ᑲᓇᑕᒥ ᑎᖓᒥᔨᑲᑦ ᓴᐳᓪᓂᐊᖅᑎᓂᑦ ᐱᓕᓇᐊᖅ ᐊᑦᑐᓂᖓᓪᓗᑕᒥᓗᓂ ᐊᑕᐅᔪᖏᑦ ᑭᔪᐊᓂ ᖁᐅᓴᓴᑎᖁᓕᓂᖅᓴᖏᓐᓄᑦ ᐱᓴᖅᑕᐅᑦ. DND-ᓄᑦ ᖁᓴᔪᐅᓴᓭᓪᓂᖅᓄᑦ ᓂᓇᐅᔨᑎᖁᐃᓪᓚᖅᑐᑦ ᑲᑎᒪᔨᖅᑐᑦᑕᒥᓗᓂ ᐊᑐᖅᑕᐅᔭᓪᓗᐊᖅᓯᒪᓚᖅ ᓄᓇᕗᑦ ᐃᒪᓕᓇᔭᖅᓄᑦ ᑲᑎᒪᔨᖅᑎᑕᐅᓂᒃ ᐊᑐᓕᖅᓂᖓᓪᓗᐊᖅᓂᖅᓄᑕ ᐊᑐᓕᖅᑐᖅᓯᒪᓚᖅᑐᑦ ᐊᑐᖅᑕᐅᓂᒃ ᐊᔪᑦ ᑲᓇᑕᒥ ᑎᖓᒥᔨᑲᑦ ᐱᓕᓇᕐᐅᑦ ᐱᓕᕆᔨᖅᑎᑦ ᐊᑐᖅᑕᐅᓂᒃ 2021 ᐊᒻᒪᓗ/ᐅᕝᕙᓗᓂᓕᑦ ᓄᓇᐃᑦ ᐊᐃᑦᑐᖅᑕᐅᓯᒪᓂᖅᑎᑦᑕᒥᓂᑦ ᐊᑐᐊᑎᐅᑎᑕᐅᔨᑦ ᐃᑯᓕᖅᑎᑕᐅᕐᓕᑕ.

Rapport annuel 2020 à l'Office des eaux du Nunavut

Détenteur du permis : Ministère de la Défense nationale – Ops Imm – SMA(IE)
Permis : 8AC-ALT1929 Type « A » (anciennement 3BC-ALT1015 Type « B »)
Endroit : Station des Forces canadiennes Alert, île d'Ellesmere,
région de Qikiqtani, Nunavut.

Rapport présenté par : Ministère de la Défense nationale –
8e Escadre/Base des Forces canadiennes Trenton –
Gestion environnementale de la 8e Escadre,
31 mars 2021

Sommaire

Le rapport annuel 2020 présenté à l'Office des eaux du Nunavut (OEN) constitue une exigence aux termes du permis no 8AC-ALT1929 Type « A », partie B, paragraphe 1. Le présent rapport annuel vise la Station des Forces canadiennes (SFC) Alert, au Nunavut. Le permis a été délivré le 1er novembre 2019 au ministère de la Défense nationale (MDN) – Opérations immobilières (Nord) [Ops Imm (Nord)] du sous-ministre adjoint (Infrastructure et environnement) [SMA(IE)]. Comme la 8e Escadre/Base des Forces canadiennes (BFC) Trenton, en Ontario, supervise la SFC Alert, la 8e Escadre Trenton présente le rapport annuel au nom du nouveau détenteur de permis du MDN, les Ops Imm (Nord) du SMA(IE). Il s'agit du premier rapport présenté en vertu des nouvelles conditions de permis.

En 2020, l'utilisation quotidienne moyenne d'eau à la SFC Alert était de 565 m^3, ce qui est inférieur à la consommation quotidienne de 875 m^3 d'eau autorisée par le permis de l'OEN. La quantité d'eau utilisée quotidiennement qui est déclarée est légèrement inférieure à la quantité d'eau brute puisée quotidiennement de la source du lac Upper Dumbell. Une grande partie de l'eau utilisée est retournée directement (brute et non traitée) à la source en même temps qu'elle est puisée, et la quantité moyenne d'eau retournée s'élève à 563 m^3 par jour. Cette circulation constante de l'écoulement (restitué) de l'eau brute empêche le gel d'endommager les canalisations d'eau. La quantité moyenne d'eau consommée quotidiennement était de 72 m^3. La quantité annuelle totale d'eau utilisée en 2020 était de 201 615 m^3.

En 2020, les déchets dangereux (piles, liquides dangereux, amiante) ont été réacheminés de la SFC Alert vers l'Ontario pour être éliminés à l'extérieur du Nunavut par des entrepreneurs externes. Les déchets ménagers non dangereux produits par la SFC Alert ont été acheminés à la décharge principale désignée. Les réparations annuelles du système de traitement des eaux usées à paliers ont été effectuées au printemps 2020. Toutes les eaux usées ont été rejetées dans ce système.

Comme c'est le cas partout dans le monde en raison de la pandémie de COVID-19, l'équipe de soutien de la SFC Alert a été réduite et aucune visite n'a été autorisée sur les lieux afin d'éviter toute propagation ou transmission du virus. Par conséquent, l'équipe de soutien et d'échantillonnage environnemental n'a pas pu se rendre à la SFC Alert en 2020, ce qui a

grandement limité les exigences en matière d'échantillonnage pour le programme de réseau de surveillance de la SFC Alert de 2020, car une seule opération d'échantillonnage a pu être menée. Le MDN maintient son engagement positif à démontrer sa conformité au permis de l'OEN et prévoit rétablir les capacités du programme à l'été 2021, ou dès que les restrictions territoriales seront levées.

NWB Annual Report 2020

NWB Annual Report **Year being reported:** 2020

License No: 8AC-ALT1929 **Issued Date:** November 1, 2019
Expiry Date: October 31, 2029

Project Name: Canadian Forces Station (CFS) Alert, Nunavut

Licensee: Department of National Defence - Real Property Operations-ADM(IE)

Mailing Address:
Real Property Operations Group
Department of National Defence
Assistant Deputy Minister (Infrastructure & Environment)
101 Col By Drive, Ottawa, ON, K1A 0K2

Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable):

8 Wing Environmental Management
Room 308, Building 22, 74 Polaris Ave.
Department of National Defence - 8 Wing/ CFB Trenton
Box 1000, Stn Forces
Astra, Ontario, K0K 3W0

General Background Information on the Project (*optional):

Formerly: 8AC-ALT---- Type A until Oct 31, 2019.
Formerly: 3BC-ALT1015 Type B.

Licence Requirements: the licensee must provide the following information in accodance with

Part B Item 1

A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management.

Water Source(s):	Upper Dumbell Lake, Nunavut.	
Water Quantity:	875	Quantity Allowable Domestic (cu.m)
	565	Actual Quantity Used Domestic (cu.m)
		Quantity Allowable Drilling (cu.m)

Total Quantity Used Drilling (cu.m)

Waste Management and/or Disposal

- [x] Solid Waste Disposal
- [x] Sewage
- [ ] Drill Waste
- [x] Greywater
- [x] Hazardous
- [x] Other:

Landfarms

Additional Details:

Appendix A: Monitoring Program Station No. ALT-1
Appendix B: Monitoring Program Stations No. ALT-2-3
Appendix C: Monitoring Program Stations No. ALT-4-5-6-7
Appendix D: Monitoring Program Stations No. ALT-8-9-10-11
Appendix E: June/July Analysis Results for ALT-4-8-9-10
Appendix F: List of Waste Disposal Activities / Copies of Movement Documents
Appendix G: Progressive and Final Reclamation Work Undertaken
Appendix H: Proposed/ Future Inrastructure Works

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: (as reported to the Spill Hot-line)

Date of Spill:

Date of Notification to an Inspector:

Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

No major sills reported in 2020.

Revisions to the Spill Contingency Plan

SCP submitted and approved - no revision required or proposed

Additional Details:

Revised Spill contingency plan was submitted to the Board December 24, 2019.

Revisions to the Abandonment and Restoration Plan

AR plan submitted and approved - no revision required or proposed

Additional Details:

No revisions required.

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

See Appendix G.

Results of the Monitoring Program including:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where sources of water are utilized;

Not Applicable (N/A)

Additional Details:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where wastes associated with the licence are deposited;

Not Applicable (N/A)

Additional Details:

Results of any additional sampling and/or analysis that was requested by an Inspector

No additional sampling requested by an Inspector or the Board

Additional Details: (date of request, analysis of results, data attached, etc)

Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

No additional sampling requested by an Inspector or the Board

Additional Details: (Attached or provided below)

Any responses or follow-up actions on inspection/compliance reports

No inspection and/or compliance report issued by INAC

Additional Details: (Dates of Report, Follow-up by the Licensee)

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Any additional comments or information for the Board to consider

Date Submitted:	March 31, 2021	
Submitted/Prepared by:	Nathan Koutroulides, BSc, PMP	
Contact Information:	**Tel:**	613-392-2811 x4821
	Fax:	613-965-3368
	email:	Nathan.Koutroulides@forces.gc.ca

GPS Coordinates for water sources utilized

Source Description	Latitude			Longitude		
	Deg °	Min ′	Sec ″	Deg °	Min ′	Sec ″
Upper Dumbell Lake	82	29	6.2	-62	28	9.5

GPS Locations of areas of waste disposal

Location Description (type)	Latitude			Longitude		
	Deg °	Min '	Sec "	Deg °	Min '	Sec "
Alert Battery Dump	82	29	16	-62	23	15.32
Alert Main Station Landfill	82	30	17	-62	20	14.89
Alert Dump # 3	82	29	18	-62	20	57.01
Landfarm (ALT-11)	82	30	40	-62	18	37.6
Millionaire's Dump	82	29	19	-62	21	30.4
Sewage Terrace/Outfall	82	29	56	-62	21	4.8
Landfarm (ALT-12)	82	29	58	-62	21	16

Appendix A

Monitoring Program Station No. ALT-1
Year: 2020
Name: Water Supply at Raw Water Intake
Licence Daily Water Use (to not exceed) Limit: 875 cubic metres [m^3].

Results for: All Purpose Water Monitoring
Daily Water Usage Quantity: 565 cubic metres [m^3].
Annual Water Usage Quantity: 201,615 cubic metres [m^3].

Average Daily Water Usage at CFS Alert - 8AC-ALT1929

Year	Month	Days	Average Daily Intake (Usage)	Maximum Daily Intake	Average Daily Returned	Maximum Daily Return	Average Daily Utilized (Consumed)	Maximum Daily Utilized (Consumed)	Metered	Quantity Utilized
[yr]	*[mo]*	*[day]*	*[m3/day]*	*[m3/day]*	*[m3/day]*	*[m3/day]*	*[m3/day]*	*[m3/day]*	[Y/N]	[m3]
2020	JAN	31	**529**	604	481	531	**48**	**73**	Y	16,407
2020	FEB	28	**546**	619	465	534	**81**	**162**	Y	15,301
2020	MAR	31	**544**	637	466	564	**78**	**154**	Y	16,855
2020	APR	30	**558**	674	491	635	**67**	**170**	Y	16,753
2020	MAY	31	**563**	711	490	604	**73**	**107**	Y	17,460
2020	JUN	30	**565**	689	488	582	**77**	**107**	Y	16,956
2020	JUL	31	**561**	614	482	522	**79**	**96**	Y	17,397
2020	AUG	31	**556**	620	483	533	**73**	**94**	Y	17,247
2020	SEP	30	**551**	616	481	539	**70**	**94**	Y	16,525
2020	OCT	31	**542**	636	469	542	**73**	**127**	Y	16,812
2020	NOV	30	**559**	687	485	607	**74**	**94**	Y	16,781
2020	DEC	31	**552**	634	484	558	**69**	**94**	Y	17,121
Annual Average [m3/day]:			**552**	645	481	563	**72**	114	**Total Annual [m3]:**	**201,615**
Observed Minimum [m3/day]:			529	604	465	***522***	48	73		
Observed Maximum [m3/day]:			***565***	711	491	635	81	170		

Average Daily Water Intake (Usage) from Source: 552 cubic metres [m^3].
Average Daily Water Return to Source: 563 cubic metres [m^3].
Average Daily Water Utilized (Consumed): 72 cubic metres [m^3].

The usage for 2020 was in compliance with, or below the Licence Daily Water Use Limit of 875 m^3.

Appendix B

Monitoring Program Station No. ALT-2 & ALT 3
Year: 2020
Month: July to August
ALT-2 Name: Sewage Terrace Outfall Point
ALT-3 Name: Sewage Terrace Final Discharge Point
Description: Effluent Quality Results.

Notes:
The Alert Sewage Terrace System is being monitored by Nasittuq Corporation, under service contract by DND and administrated by 8 Wing Trenton Environmental Management in Trenton, Ontario. Water quality samples are collected and analyzed by ALS Canada Ltd., Ontario.

Summary of Results:

ALT-2 is located at the Sewage Terrace Outfall Point.
ALT-3 is located at the Sewage Terrace Final Discharge Point (Parr Inlet).

In reference to **Part E, Item 4**, for ALT-3 and /or Alt 13, the results are summarized:

		June		June		July		July
	Licence Specific Criteria	**Alt-2**		**Alt-3**		**Alt-2**		**Alt-3**
Benzene (ug/L)	370	NA		NA		NA		NA
Toluene (ug/L)	2	NA		NA		NA		NA
Ethylbenzene (ug/L)	90	NA		NA		NA		NA
Lead (ug/L)	1	**5.78**		7.85		1.85		1.8
Oil and Grease (mg/L)	15 (NVS)	5.5		ND		8.6		8.5
Phenols (ug/L)	20	8.9		9.4		3.3		7.3
BOD_5 (mg/L)	80	18		19		24		15
pH		7.4		7.27		7.45		7.47
TSS (mg/L)	70	**374**		**371**		**57.5**		**58.3**
Oil and Grease (mg/L)	5 (NVS)	**5.5**		ND		8.6		8.5
	CCME Criteria (marine)							
pH	7.0 to 8.7	7.4		7.27		7.45		7.47
Conductivity	---	459		462		558		556
Temperature (field)	---							
TSS (mg/L)	---	374		371		57.5		58.3
Oil and Grease (mg/L)	---	5.5		ND		8.6		8.5

Nitrate-Nitrite (mg/L)	---	ND		ND		ND		ND
Ammonia Nitrogen (mg/L)	---	7.15		6.54		10.1		10.3
Sulphate (mg/L)	---	7.73		7.88		8.06		8.13
Total Hardness (mg/L)	---	171		209		NA		NA
Total Alkalinity (mg/L)	---	158		158		208		207
Total Phenols (mg/L)	---	8.9		9.4		3.3		7.3
TOC (mg/L)	---	114		133		126		118
Fecal Coliforms (CFU/100mL)	---	650000		480000		1000000		800000
Aluminum (mg/L)	---	3.15		4.43		0.389		0.385
Antimony (mg/L)	0.5	ND		ND		0.00023		0.00022
Arsenic (mg/L)	0.0125	0.0089		0.0101		0.00694		0.00663
Cadmium (mg/L)	0.12	0.000109		0.000101		0.0000334		0.0000355
Calcium (mg/L)	---	50.3		62.9		51.9		49.2
Chromium (mg/L)	---	0.0062		0.0089		0.00104		0.00119
Copper (mg/L)	0.002	0.062		0.0681		0.0588		0.0588
Iron (mg/L)	---	6.56		9.24		2.34		2.34
Lead (mg/L)	0.002	5.78		7.85		1.85		1.8
Magnesium (mg/L)	---	11		12.7		11.1		10.8
Mercury (mg/L)	0.00016	ND		ND		ND		ND
Nickle (mg/L)	0.0083	0.033		0.0383		0.0209		0.0203
Potassium (mg/L)	---	6.17		6.23		8.22		7.89
Sodium (mg/L)	---	29.3		29		34.9		33.5
Zinc (mg/L)	0.01	0.038		0.035		0.0123		0.0128
BOD5 (mg/L)	---	18		19		24		15
Chloride (mg/L)	---	37.6		37.6		41.1		40.9
Benzene (ug/L)	110	NA		NA		NA		NA
Ethylbenzene (ug/L)	25	NA		NA		NA		NA
Toluene (ug/L)	215	NA		NA		NA		NA
Xylenes (ug/L)	---	NA		NA		NA		NA
F1 (ug/L)	---	NA		NA		NA		NA
F2 (ug/L)	---	NA		NA		NA		NA
F3 (ug/L)	---	NA		NA		NA		NA
F4 (ug/L)	---	NA		NA		NA		NA
Acenaphthene (ug/L)	---	NA		NA		NA		NA
Acenaphthylene (ug/L)	---	NA		NA		NA		NA

Acridine (ug/L)	---	NA		NA		NA		NA
Benzo(a)anthracene (ug/L)	---	NA		NA		NA		NA
Benzo(o)pyrene (ug/L)	---	NA		NA		NA		NA
Benzo(b)fluoranthere (ug/L)	---	NA		NA		NA		NA
Benzo(g,h,i)perylene (ug/L)	---	NA		NA		NA		NA
Benzo(k)fluoranthere (ug/L)	---	NA		NA		NA		NA
Chrysene (ug/L)	---	NA		NA		NA		NA
Dibenzo(ah)anthracene (ug/L)	---	NA		NA		NA		NA
Fluoranthene (ug/L)	---	NA		NA		NA		NA
Fluorene (ug/L)	---	NA		NA		NA		NA
Indeno(1,2,3-cd)pyrene (ug/L)	---	NA		NA		NA		NA
1+2-Methylnapthalenes (ug/L)	---	NA		NA		NA		NA
1-Methylnapthalene (ug/L)	---	NA		NA		NA		NA
2-Methylnapthalene (ug/L)	---	NA		NA		NA		NA
Napthalene (ug/L)	1.4	NA		NA		NA		NA
Phenanthrene (ug/L)	---	NA		NA		NA		NA
Pyrene (ug/L)	---	NA		NA		NA		NA
Quinoline (ug/L)	---	NA		NA		NA		NA

- Oil and Grease parameters exceed the maximum allowable concentrations at ALT-2 for Oil and Grease.
- TSS exceeded the Licence parameters of 70mg/L. DND will conduct a background sampling program of other small tributaries away from DND activities to ascertain if the 70mg/L set criteria is achievable in natural tributaries in the Alert area.
- Lead, Copper, Nickle and Zinc exceedances are likely attributable to atmospheric deposition. DND will conduct a background sampling program away from DND activities to link correlations in the summer of 2021.
- The analytical certificates detailing the 2020 performance of the Alert Sewage Terrace System is included in this Appendix (B).
- Due to limited personnel on Station during 2020 and COVID 19 constraints and frequent safety concerns associated with wildlife interactions, limited samples were collected. DND is committed to demonstrating compliance to the NWB Licence once capabilities are increased in the summer 2021 and/or once Territorial restrictions are lifted.

Appendix C

Monitoring Program Stations No. ALT-4-5-6-7
Year: 2020
Description: Runoff and Leachate.

Results:

June (Runoff Season)
Unfortunately, there was no water to sample at ALT- 5,6 and 7 for analytical results. Analytical Results for ALT-4, are attached in Appendix E and Appendix F.
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Jun-20			
	Licence Specific Criteria		**Alt-4**
Benzene (ug/L)	370		NA
Toluene (ug/L)	2		NA
Ethylbenzene (ug/L)	90		NA
Lead (ug/L)	1		6.97
Oil and Grease (mg/L)	15 (NVS)		ND
Phenols (ug/L)	20		ND
BOD_5 (mg/L)	80		NA
pH			7.96
TSS (mg/L)	70		131
Oil and Grease (mg/L)	5 (NVS)		ND
	CCME Criteria (marine)		
pH	7.0 to 8.7		7.96
Conductivity	---		234
Temperature (field)	---		
TSS (mg/L)	---		131
Oil and Grease (mg/L)	---		ND
Nitrate-Nitrite (mg/L)	---		0.199
Ammonia Nitrogen (mg/L)	---		ND
Sulphate (mg/L)	---		24.8
Total Hardness (mg/L)	---		106
Total Alkalinity (mg/L)	---		64
Total Phenols (mg/L)	---		ND
TOC (mg/L)	---		25.8
Fecal Coliforms (CFU/100mL)	---		NA
Aluminum (mg/L)	---		3.7

Antimony (mg/L)	0.5		0.00239
Arsenic (mg/L)	0.0125		0.0081
Cadmium (mg/L)	0.12		0.000062
Calcium (mg/L)	---		30.2
Chromium (mg/L)	---		0.00722
Copper (mg/L)	0.002		0.0138
Iron (mg/L)	---		6.37
Lead (mg/L)	0.002		6.97
Magnesium (mg/L)	---		7.46
Mercury (mg/L)	0.00016		0.0000069
Nickle (mg/L)	0.0083		0.0165
Potassium (mg/L)	---		2.65
Sodium (mg/L)	---		10.2
Zinc (mg/L)	0.01		0.0456
BOD5 (mg/L)	---		NA
Chloride (mg/L)	---		NA
Benzene (ug/L)	110		NA
Ethylbenzene (ug/L)	25		NA
Toluene (ug/L)	215		NA
Xylenes (ug/L)	---		NA
F1 (ug/L)	---		NA
F2 (ug/L)	---		NA
F3 (ug/L)	---		NA
F4 (ug/L)	---		NA
Acenaphthene (ug/L)	---		NA
Acenaphthylene (ug/L)	---		NA
Acridine (ug/L)	---		NA
Benzo(a)anthracene (ug/L)	---		NA
Benzo(o)pyrene (ug/L)	---		NA
Benzo(b)fluoranthere (ug/L)	---		NA
Benzo(g,h,i)perylene (ug/L)	---		NA
Benzo(k)fluoranthere (ug/L)	---		NA
Chrysene (ug/L)	---		NA
Dibenzo(ah)anthracene (ug/L)	---		NA
Fluoranthene (ug/L)	---		NA
Fluorene (ug/L)	---		NA
Indeno(1,2,3-cd)pyrene (ug/L)	---		NA
1+2-Methylnapthalenes (ug/L)	---		NA
1-Methylnapthalene (ug/L)	---		NA
2-Methylnapthalene (ug/L)	---		NA

Napthalene (ug/L)	1.4		NA
Phenanthrene (ug/L)	---		NA
Pyrene (ug/L)	---		NA
Quinoline (ug/L)	---		NA

- TSS exceeded the Licence parameters of 70mg/L. DND will conduct a background sampling program of other small tributaries away from DND activities to ascertain if the 70mg/L set criteria is achievable in natural tributaries in the Alert area.
- Lead, Copper, Nickle and Zinc exceedances are likely attributable to atmospheric deposition. DND will conduct a background sampling program away from DND activities to link correlations in the summer of 2021

July

The Department of National Defence was successful in collecting and analyzing samples at Monitoring Program Station ALT-4, during the period of runoff in July 2020. Unfortunately, there was no water to sample at ALT- 5,6 and 7 for analytical results. Analytical Results for ALT-4, are attached in Appendix E and Appendix F.

	Licence Specific Criteria	**Alt-4**
Benzene (ug/L)	370	NA
Toluene (ug/L)	2	NA
Ethylbenzene (ug/L)	90	NA
Lead (ug/L)	1	NA
Oil and Grease (mg/L)	15 (NVS)	ND
Phenols (ug/L)	20	ND
BOD_5 (mg/L)	80	NA
pH		8.12
TSS (mg/L)	70	179
Oil and Grease (mg/L)	5 (NVS)	NA
	CCME Criteria (marine)	
pH	7.0 to 8.7	8.12
Conductivity	---	230
Temperature (field)	---	
TSS (mg/L)	---	179
Oil and Grease (mg/L)	---	ND
Nitrate-Nitrite (mg/L)	---	0.115
Ammonia Nitrogen (mg/L)	---	ND
Sulphate (mg/L)	---	21.6
Total Hardness (mg/L)	---	123
Total Alkalinity (mg/L)	---	70
Total Phenols (mg/L)	---	ND
TOC (mg/L)	---	46
Fecal Coliforms (CFU/100mL)	---	NA
Aluminum (mg/L)	---	6.74
Antimony (mg/L)	0.5	0.00298
Arsenic (mg/L)	0.0125	0.0131
Cadmium (mg/L)	0.12	0.00008
Calcium (mg/L)	---	33.3
Chromium (mg/L)	---	0.0122
Copper (mg/L)	0.002	0.0236

Iron (mg/L)	---	11.5
Lead (mg/L)	0.002	12.2
Magnesium (mg/L)	---	9.76
Mercury (mg/L)	0.00016	0.0000339
Nickle (mg/L)	0.0083	0.0292
Potassium (mg/L)	---	2.96
Sodium (mg/L)	---	8.37
Zinc (mg/L)	0.01	0.0616
BOD5 (mg/L)	---	NA
Chloride (mg/L)	---	NA
Benzene (ug/L)	110	NA
Ethylbenzene (ug/L)	25	NA
Toluene (ug/L)	215	NA
Xylenes (ug/L)	---	NA
F1 (ug/L)	---	NA
F2 (ug/L)	---	NA
F3 (ug/L)	---	NA
F4 (ug/L)	---	NA
Acenaphthene (ug/L)	---	NA
Acenaphthylene (ug/L)	---	NA
Acridine (ug/L)	---	NA
Benzo(a)anthracene (ug/L)	---	NA
Benzo(o)pyrene (ug/L)	---	NA
Benzo(b)fluoranthere (ug/L)	---	NA
Benzo(g,h,i)perylene (ug/L)	---	NA
Benzo(k)fluoranthere (ug/L)	---	NA
Chrysene (ug/L)	---	NA
Dibenzo(ah)anthracene (ug/L)	---	NA
Fluoranthene (ug/L)	---	NA
Fluorene (ug/L)	---	NA
Indeno(1,2,3-cd)pyrene (ug/L)	---	NA
1+2-Methylnapthalenes (ug/L)	---	NA
1-Methylnapthalene (ug/L)	---	NA
2-Methylnapthalene (ug/L)	---	NA
Napthalene (ug/L)	1.4	NA
Phenanthrene (ug/L)	---	NA
Pyrene (ug/L)	---	NA
Quinoline (ug/L)	---	NA

- TSS exceeded the Licence parameters of 70mg/L. DND will conduct a background sampling program of other small tributaries away from DND activities to ascertain if the 70mg/L set criteria is achievable in natural tributaries in the Alert area.
- Arsenic, Lead, Copper, Nickle and Zinc exceedances are likely attributable to atmospheric deposition. DND will conduct a background sampling program away from DND activities to link correlations in the summer of 2021

August

The Department of National Defence was not successful in collecting samples at Monitoring Program Station ALT-4, 5, 6 or 7, during the period of runoff in August 2020 due to logistical constrains associated with COVID-19.

September

The Department of National Defence was not successful in collecting samples at Monitoring Program Station ALT-4, 5, 6 or 7, during the period of runoff in September 2020 due to logistical constrains associated with COVID-19.

Appendix D

Monitoring Program Stations No. ALT-8-9-10-11
Year: 2020
Description: Discharge from Tank Farm Secondary Containments ALT-8-9-10 & Landfarm Facility ALT-10-11.

Results:

The Department of National Defence (DND) intended to discharge water from the Fuel Tank Farm Secondary Containments at ALT-8-9-10 in July 2020. At least 10 days notice was provided to the Inspector and Nunavut Water Board, the email chain is attached below.

Water samples from within the secondary containments of ALT-8-8.1-9-10 were collected on 20 July 2020 and analyzed; analytical results are attached in Appendix E.

Two samples were taken at ALT-8 (sample identifications: ALT-8 and ALT-8.1) to better represent the freshet quality due to the large size of the Secondary Containment facility.

In July 2020, analytical results (Appendix E) of the berm water results at the Lower Airfield Tank Farm (ALT-8, -8.1), Upper Tank Farm (ALT-9), and the Day Tank (ALT-10) are compliant to the Effluent Quality Limits of the Alert Water Licence, as per Part E, Item 12 and 13.

DND had no intentions to discharge any water from Land Farm Treatment Facilities at ALT-10 and ALT-11.

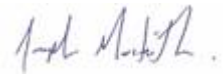
Notes (extra spaces removed):

-------- Original message --------
From: "Monteith, Joseph (AADNC/AANDC)" <joseph.monteith@canada.ca>
Date: 2020-08-06 2:47 p.m. (GMT-05:00)
To: "Koutroulides NG@CFB Trenton WENV@Trenton" <NATHAN.KOUTROULIDES@forces.gc.ca>
Subject: RE: 8AC-ALT1929 - CFS Alert - Berm Secondary Containment Water Discharge Approval Request ALT 8.1 re-sample

Hello,

Thank you for the follow up. You may proceed to decant. Please review the Operations and Maintenance Manual in regards to decanting berm water. I've reviewed the test results, and they are within acceptable effluent quality limits.

Regards,



Joseph Monteith
Water Resources Officer
Qikiqtani and High Arctic Region
Crown-Indigenous Relations
And Northern Affairs Canada
P.O. Box 2200
Iqaluit, NU
X0A 0H0
Ph: 867 975-4289
Cell: 867 975-1787
Fax: 867 979-6445
Email:joseph.monteith@canada.ca

Crown-Indigenous Relations and Northern Affairs Canada | Relations Couronne-Autochtones et Affaires du Nord Canada

From: NATHAN.KOUTROULIDES@forces.gc.ca [mailto:NATHAN.KOUTROULIDES@forces.gc.ca]
Sent: Thursday, August 06, 2020 1:06 PM
To: Mesher, Jonathan (AADNC/AANDC); Monteith, Joseph (AADNC/AANDC)
Cc: Allain, Erik (AADNC/AANDC); Andrew.Tam@forces.gc.ca
Subject: 8AC-ALT1929 - CFS Alert - Berm Secondary Containment Water Discharge Approval Request ALT 8.1 re-sample

Hello Jonathan and Joseph;

Further to the email sent on 20 July, 2020 DND has resampled the Lower Tank Farm (ALT-8.1 White Tanks) affected berm water which previously came back non-compliant to the Effluent Quality Limits of the Alert Water Licence.

Please see attached analytical results. Lower Tank Farm (ALT-8.1 White Tanks) has since been found to be compliant to the Effluent Quality Limits of the Alert Water Licence (Phenols are 15.1 ug/L (NWB limit is 20 ug/L)), as per Part E, Item 12. Note: Samples were not gathered by 8 WEnv due to the current flight restrictions from COVID-19. Samples were gathered on site by staff currently on station.

As per the condition of Part E, Item 13, I am providing DND's intent to discharge the effluents from the ALT 8.1 fuel tank farms within 10 days; however, to help expedite the process and given Alert's short outdoor summer season, may I please request your approval to discharge the effluents from these two facilities as soon as possible?

I will also issue DND direction the CFS Alert staff responsible for the water discharges to ensure that no ruts in the tundra are created and to ensure that sediment erosion protections are taken as per the Alert Water Management plan.

Thank you for your assistance.

Regards,

Nathan Koutroulides, B.Sc, CD, PMP.
8 Wing Deputy Environment Officer, Environmental Management
Department of National Defence / Government of Canada
Nathan.Koutroulides@forces.gc.ca / Tel: 613-392-2811 Ext. 4821

Adjoint Officier de l'environnement de la 8ième escadre, Gestion d'environnement
Ministère de la Défense nationale / Gouvernement du Canada
Nathan.Koutroulides@forces.gc.ca / Tél: 613-392-2811 Ext. 4821

Appendix E

Analytical Results for ALT-2-3-4-5-6-7-8-9-10-11
Year: 2020

Description: Analytical Results for June/July 2020.

Defence Construction Canada
ATTN: CAMERON CHADWICK
8 WING/CFB TRENTON
ASTRA On K0K 3WD

Date Received: 07-JUL-20
Report Date: 17-JUL-20 13:06 (MT)
Version: FINAL

Client Phone: 613-392-2811

Certificate of Analysis

Lab Work Order #: L2470192
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

N. Gudzak

Nellie Gudzak
Account Manager

ADDRESS: 190 Colonnade Road, Unit 7, Ottawa, ON K2E 7J5 Canada | Phone: +1 613 225 8279 | Fax: +1 613 225 2801
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Reference Information

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1□C for a minimum of four hours or until a constant weight is achieved.

TOC-WT	Water	Total Organic Carbon	APHA 5310B

Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2470192 Report Date: 17-JUL-20

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3WD

Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-WT	Water							
Batch R5152182								
WG3361350-4 DUP		**WG3361350-3**						
Alkalinity, Total (as CaCO3)		360	357		mg/L	0.9	20	13-JUL-20
WG3361350-2 LCS								
Alkalinity, Total (as CaCO3)			99.6		%		85-115	13-JUL-20
WG3361350-1 MB								
Alkalinity, Total (as CaCO3)			<10		mg/L		10	13-JUL-20
BTX-511-HS-WT	Water							
Batch R5145832								
WG3356798-4 DUP		**WG3356798-3**						
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	08-JUL-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	08-JUL-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
WG3356798-1 LCS								
Benzene			102.1		%		70-130	08-JUL-20
Ethylbenzene			93.4		%		70-130	08-JUL-20
m+p-Xylenes			98.2		%		70-130	08-JUL-20
o-Xylene			97.7		%		70-130	08-JUL-20
Toluene			95.5		%		70-130	08-JUL-20
WG3356798-2 MB								
Benzene			<0.50		ug/L		0.5	08-JUL-20
Ethylbenzene			<0.50		ug/L		0.5	08-JUL-20
m+p-Xylenes			<0.40		ug/L		0.4	08-JUL-20
o-Xylene			<0.30		ug/L		0.3	08-JUL-20
Toluene			<0.50		ug/L		0.5	08-JUL-20
Surrogate: 1,4-Difluorobenzene			105.1		%		70-130	08-JUL-20
Surrogate: 4-Bromofluorobenzene			105.3		%		70-130	08-JUL-20
WG3356798-5 MS		**WG3356798-3**						
Benzene			104.3		%		50-140	08-JUL-20
Ethylbenzene			91.1		%		50-140	08-JUL-20
m+p-Xylenes			97.2		%		50-140	08-JUL-20
o-Xylene			95.5		%		50-140	08-JUL-20
Toluene			94.9		%		50-140	08-JUL-20
EC-WT	Water							

ALS Environmental

Quality Control Report

Workorder: L2470192 Report Date: 17-JUL-20

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3WD

Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WT	Water							
Batch R5145782								
WG3357207-4 DUP		**WG3357207-3**						
Conductivity		1830	1810		umhos/cm	0.9	10	07-JUL-20
WG3357207-2 LCS								
Conductivity			102.6		%		90-110	07-JUL-20
WG3357207-1 MB								
Conductivity			<3.0		umhos/cm		3	07-JUL-20
F1-HS-511-WT	Water							
Batch R5145832								
WG3356798-4 DUP		**WG3356798-3**						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	08-JUL-20
WG3356798-1 LCS								
F1 (C6-C10)			106.9		%		80-120	08-JUL-20
WG3356798-2 MB								
F1 (C6-C10)			<25		ug/L		25	08-JUL-20
Surrogate: 3,4-Dichlorotoluene			110.3		%		60-140	08-JUL-20
WG3356798-5 MS		**WG3356798-3**						
F1 (C6-C10)			102.4		%		60-140	08-JUL-20
F2-F4-511-WT	Water							
Batch R5146714								
WG3357758-2 LCS								
F2 (C10-C16)			102.9		%		70-130	09-JUL-20
F3 (C16-C34)			102.8		%		70-130	09-JUL-20
F4 (C34-C50)			107.6		%		70-130	09-JUL-20
WG3357758-1 MB								
F2 (C10-C16)			<100		ug/L		100	09-JUL-20
F3 (C16-C34)			<250		ug/L		250	09-JUL-20
F4 (C34-C50)			<250		ug/L		250	09-JUL-20
Surrogate: 2-Bromobenzotrifluoride			83.1		%		60-140	09-JUL-20
HG-T-CVAA-WT	Water							
Batch R5146097								
WG3357881-4 DUP		**WG3357881-3**						
Mercury (Hg)-Total		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	08-JUL-20
WG3357881-2 LCS								
Mercury (Hg)-Total			102.0		%		80-120	08-JUL-20
WG3357881-1 MB								
Mercury (Hg)-Total			<0.000005(		mg/L		0.000005	08-JUL-20
WG3357881-6 MS		**WG3357881-5**						

Quality Control Report

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3WD
Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAA-WT	Water							
Batch R5146097								
WG3357881-6 MS		**WG3357881-5**						
Mercury (Hg)-Total			120.1		%		70-130	08-JUL-20
MET-T-CCMS-WT	Water							
Batch R5147168								
WG3357621-4 DUP		**WG3357621-3**						
Aluminum (Al)-Total		0.0073	0.0064		mg/L	13	20	09-JUL-20
Antimony (Sb)-Total		0.00172	0.00174		mg/L	1.3	20	09-JUL-20
Arsenic (As)-Total		0.00337	0.00345		mg/L	2.2	20	09-JUL-20
Cadmium (Cd)-Total		0.0000141	0.0000122		mg/L	14	20	09-JUL-20
Calcium (Ca)-Total		133	135		mg/L	0.9	20	09-JUL-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	09-JUL-20
Copper (Cu)-Total		0.00320	0.00325		mg/L	1.4	20	09-JUL-20
Iron (Fe)-Total		0.026	0.025		mg/L	5.6	20	09-JUL-20
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	09-JUL-20
Magnesium (Mg)-Total		16.2	16.1		mg/L	0.6	20	09-JUL-20
Nickel (Ni)-Total		0.00604	0.00600		mg/L	0.7	20	09-JUL-20
Potassium (K)-Total		26.8	26.8		mg/L	0.2	20	09-JUL-20
Sodium (Na)-Total		61.2	60.9		mg/L	0.5	20	09-JUL-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	09-JUL-20
WG3357621-2 LCS								
Aluminum (Al)-Total			101.8		%		80-120	09-JUL-20
Antimony (Sb)-Total			102.7		%		80-120	09-JUL-20
Arsenic (As)-Total			99.3		%		80-120	09-JUL-20
Cadmium (Cd)-Total			98.3		%		80-120	09-JUL-20
Calcium (Ca)-Total			95.4		%		80-120	09-JUL-20
Chromium (Cr)-Total			100.3		%		80-120	09-JUL-20
Copper (Cu)-Total			98.6		%		80-120	09-JUL-20
Iron (Fe)-Total			100.5		%		80-120	09-JUL-20
Lead (Pb)-Total			96.5		%		80-120	09-JUL-20
Magnesium (Mg)-Total			105.0		%		80-120	09-JUL-20
Nickel (Ni)-Total			98.9		%		80-120	09-JUL-20
Potassium (K)-Total			97.4		%		80-120	09-JUL-20
Sodium (Na)-Total			100.8		%		80-120	09-JUL-20
Zinc (Zn)-Total			97.5		%		80-120	09-JUL-20

Quality Control Report

Workorder: L2470192 Report Date: 17-JUL-20

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3WD
Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT	Water							
Batch R5147168								
WG3357621-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	09-JUL-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	09-JUL-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	09-JUL-20
Cadmium (Cd)-Total			<0.000005		mg/L		0.000005	09-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	09-JUL-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	09-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	09-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	09-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	09-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	09-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	09-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	09-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	09-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	09-JUL-20
WG3357621-5 MS		**WG3357621-6**						
Aluminum (Al)-Total			98.8		%		70-130	09-JUL-20
Antimony (Sb)-Total			102.1		%		70-130	09-JUL-20
Arsenic (As)-Total			100.2		%		70-130	09-JUL-20
Cadmium (Cd)-Total			95.0		%		70-130	09-JUL-20
Calcium (Ca)-Total			N/A	MS-B	%		-	09-JUL-20
Chromium (Cr)-Total			100.1		%		70-130	09-JUL-20
Copper (Cu)-Total			N/A	MS-B	%		-	09-JUL-20
Iron (Fe)-Total			100.7		%		70-130	09-JUL-20
Lead (Pb)-Total			89.3		%		70-130	09-JUL-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	09-JUL-20
Nickel (Ni)-Total			92.9		%		70-130	09-JUL-20
Potassium (K)-Total			N/A	MS-B	%		-	09-JUL-20
Sodium (Na)-Total			N/A	MS-B	%		-	09-JUL-20
Zinc (Zn)-Total			86.8		%		70-130	09-JUL-20
NH3-F-WT	Water							
Batch R5146185								
WG3357235-3 DUP		**WG3357235-5**						
Ammonia, Total (as N)		0.089	0.089		mg/L	0.2	20	08-JUL-20
WG3357235-2 LCS								

Quality Control Report

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3WD
Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-WT	Water							
Batch R5146185								
WG3357235-2 LCS								
Ammonia, Total (as N)			101.5		%		85-115	08-JUL-20
WG3357235-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	08-JUL-20
WG3357235-4 MS		**WG3357235-5**						
Ammonia, Total (as N)			104.5		%		75-125	08-JUL-20
NO2-IC-WT	Water							
Batch R5146287								
WG3357537-14 DUP		**L2468994-2**						
Nitrite (as N)		2.68	2.68		mg/L	0.0	20	07-JUL-20
WG3357537-12 LCS								
Nitrite (as N)			99.7		%		90-110	07-JUL-20
WG3357537-11 MB								
Nitrite (as N)			<0.010		mg/L		0.01	07-JUL-20
WG3357537-15 MS		**L2468994-2**						
Nitrite (as N)			N/A	MS-B	%		-	07-JUL-20
NO3-IC-WT	Water							
Batch R5146287								
WG3357537-14 DUP		**L2468994-2**						
Nitrate (as N)		2.01	2.01		mg/L	0.0	20	07-JUL-20
WG3357537-12 LCS								
Nitrate (as N)			100.3		%		90-110	07-JUL-20
WG3357537-11 MB								
Nitrate (as N)			<0.020		mg/L		0.02	07-JUL-20
WG3357537-15 MS		**L2468994-2**						
Nitrate (as N)			97.7		%		75-125	07-JUL-20
OGG-TOT-WT	Water							
Batch R5150776								
WG3360434-2 LCS								
Oil and Grease, Total			95.9		%		70-130	11-JUL-20
WG3360434-1 MB								
Oil and Grease, Total			<5.0		mg/L		5	11-JUL-20
PAH-CCME-WT	Water							
Batch R5147508								
WG3357758-2 LCS								
1-Methylnaphthalene			99.2		%		50-140	10-JUL-20
2-Methylnaphthalene			96.1		%		50-140	10-JUL-20

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3WD

Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-WT	Water							
Batch R5147508								
WG3357758-2 LCS								
Acenaphthene			104.0		%		50-140	10-JUL-20
Acenaphthylene			111.4		%		50-140	10-JUL-20
Acridine			103.0		%		60-130	10-JUL-20
Anthracene			114.6		%		50-140	10-JUL-20
Benzo(a)anthracene			115.3		%		50-140	10-JUL-20
Benzo(a)pyrene			119.2		%		60-130	10-JUL-20
Benzo(b)fluoranthene			114.5		%		50-140	10-JUL-20
Benzo(g,h,i)perylene			121.6		%		50-140	10-JUL-20
Benzo(k)fluoranthene			123.2		%		50-140	10-JUL-20
Chrysene			123.4		%		50-140	10-JUL-20
Dibenzo(ah)anthracene			115.4		%		50-140	10-JUL-20
Fluoranthene			120.4		%		50-140	10-JUL-20
Fluorene			113.1		%		50-140	10-JUL-20
Indeno(1,2,3-cd)pyrene			118.2		%		50-140	10-JUL-20
Naphthalene			102.3		%		50-130	10-JUL-20
Phenanthrene			120.4		%		50-140	10-JUL-20
Pyrene			121.5		%		50-140	10-JUL-20
Quinoline			109.4		%		50-150	10-JUL-20
WG3357758-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	10-JUL-20
2-Methylnaphthalene			<0.020		ug/L		0.02	10-JUL-20
Acenaphthene			<0.020		ug/L		0.02	10-JUL-20
Acenaphthylene			<0.020		ug/L		0.02	10-JUL-20
Acridine			<4.0		ug/L		4	10-JUL-20
Anthracene			<0.020		ug/L		0.02	10-JUL-20
Benzo(a)anthracene			<0.020		ug/L		0.02	10-JUL-20
Benzo(a)pyrene			<0.0050		ug/L		0.005	10-JUL-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	10-JUL-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	10-JUL-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	10-JUL-20
Chrysene			<0.020		ug/L		0.02	10-JUL-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	10-JUL-20
Fluoranthene			<0.020		ug/L		0.02	10-JUL-20
Fluorene			<0.020		ug/L		0.02	10-JUL-20

ALS Environmental

Quality Control Report

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3WD

Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-WT	Water							
Batch R5153924								
WG3362285-5 MS		**WG3362285-3**						
Sulfate (SO4)			101.8		%		75-125	14-JUL-20
SOLIDS-TSS-WT	Water							
Batch R5146068								
WG3357399-3 DUP		**L2468561-1**						
Total Suspended Solids		99.1	101		mg/L	1.6	20	08-JUL-20
WG3357399-2 LCS								
Total Suspended Solids			86.0		%		85-115	08-JUL-20
WG3357399-1 MB								
Total Suspended Solids			<2.0		mg/L		2	08-JUL-20
TOC-WT	Water							
Batch R5152564								
WG3358111-3 DUP		**L2470947-24**						
Total Organic Carbon		9.16	9.59		mg/L	4.6	20	14-JUL-20
WG3358111-2 LCS								
Total Organic Carbon			105.2		%		80-120	14-JUL-20
WG3358111-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	14-JUL-20
WG3358111-4 MS		**L2470947-24**						
Total Organic Carbon			109.6		%		70-130	14-JUL-20

Quality Control Report

Workorder: L2470192 Report Date: 17-JUL-20

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3WD

Contact: CAMERON CHADWICK

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2470192 Report Date: 17-JUL-20

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3WD
Contact: CAMERON CHADWICK

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	30-JUN-20 14:10	07-JUL-20 00:00	4	6	days	EHTR

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2470192 were received on 07-JUL-20 09:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Defence Construction Canada
ATTN: CAMERON CHADWICK
8 WING/CFB TRENTON
ASTRA On K0K 3W0

Date Received: 07-JUL-20
Report Date: 17-JUL-20 13:12 (MT)
Version: FINAL

Client Phone: 613-392-2811

Certificate of Analysis

Lab Work Order #: L2470196
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Nellie Gudzak
Account Manager

ADDRESS: 190 Colonnade Road, Unit 7, Ottawa, ON K2E 7J5 Canada | Phone: +1 613 225 8279 | Fax: +1 613 225 2801
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2470196-1 ALT-8 Sampled By: MCPL AJ MCLAUGHLAN on 30-JUN-20 @ 14:25 Matrix: WATER							
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		08-JUL-20	R5145832
F1-BTEX	<25		25	ug/L		10-JUL-20	
F2 (C10-C16)	<100		100	ug/L	08-JUL-20	09-JUL-20	R5146714
F2-Naphth	<100		100	ug/L		10-JUL-20	
F3 (C16-C34)	<250		250	ug/L	08-JUL-20	09-JUL-20	R5146714
F3-PAH	<250		250	ug/L		10-JUL-20	
F4 (C34-C50)	<250		250	ug/L	08-JUL-20	09-JUL-20	R5146714
Total Hydrocarbons (C6-C50)	<370		370	ug/L		10-JUL-20	
Chrom. to baseline at nC50	YES				08-JUL-20	09-JUL-20	R5146714
Surrogate: 2-Bromobenzotrifluoride	94.2		60-140	%	08-JUL-20	09-JUL-20	R5146714
Surrogate: 3,4-Dichlorotoluene	97.9		60-140	%		08-JUL-20	R5145832
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Acenaphthylene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Acridine	<4.0		4.0	ug/L	08-JUL-20	10-JUL-20	R5147508
Anthracene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Benzo(a)anthracene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Benzo(a)pyrene	<0.0050		0.0050	ug/L	08-JUL-20	10-JUL-20	R5147508
Benzo(b)fluoranthene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Benzo(k)fluoranthene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Chrysene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Fluoranthene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Fluorene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		10-JUL-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
2-Methylnaphthalene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Naphthalene	<0.050		0.050	ug/L	08-JUL-20	10-JUL-20	R5147508
Phenanthrene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Pyrene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Quinoline	<0.040		0.040	ug/L	08-JUL-20	10-JUL-20	R5147508
Surrogate: d10-Acenaphthene	101.4		60-140	%	08-JUL-20	10-JUL-20	R5147508
Surrogate: d9-Acridine (SS)	87.5		40-130	%	08-JUL-20	10-JUL-20	R5147508
Surrogate: d12-Chrysene	91.2		60-140	%	08-JUL-20	10-JUL-20	R5147508
Surrogate: d8-Naphthalene	99.8		60-140	%	08-JUL-20	10-JUL-20	R5147508
Surrogate: d10-Phenanthrene	102.5		60-140	%	08-JUL-20	10-JUL-20	R5147508
B(a)P Total Potency Equivalent	<0.060		0.060	ug/L	08-JUL-20	10-JUL-20	R5147508

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2470196-1 ALT-8 Sampled By: MCPL AJ MCLAUGHLAN on 30-JUN-20 @ 14:25 Matrix: WATER							
Physical Tests							
Conductivity	289		3.0	umhos/cm		07-JUL-20	R5145782
Hardness (as CaCO3), from total Ca/Mg	95.6		0.50	mg/L		10-JUL-20	
pH	8.31	PEHR	0.10	pH units		07-JUL-20	R5145782
Total Suspended Solids	2.6		2.0	mg/L	07-JUL-20	08-JUL-20	R5146068
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	109		10	mg/L		13-JUL-20	R5152182
Ammonia, Total (as N)	0.020		0.010	mg/L		08-JUL-20	R5146185
Nitrate and Nitrite as N	<0.022		0.022	mg/L		08-JUL-20	
Nitrate (as N)	<0.020	PEHT	0.020	mg/L		07-JUL-20	R5146287
Nitrite (as N)	<0.010	PEHT	0.010	mg/L		07-JUL-20	R5146287
Sulfate (SO4)	23.1		0.30	mg/L		14-JUL-20	R5153924
Organic / Inorganic Carbon							
Total Organic Carbon	5.77		0.50	mg/L		14-JUL-20	R5152564
Total Metals							
Aluminum (Al)-Total	0.0129		0.0050	mg/L	08-JUL-20	09-JUL-20	R5147168
Antimony (Sb)-Total	0.00173		0.00010	mg/L	08-JUL-20	09-JUL-20	R5147168
Arsenic (As)-Total	0.00377		0.00010	mg/L	08-JUL-20	09-JUL-20	R5147168
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	08-JUL-20	09-JUL-20	R5147168
Calcium (Ca)-Total	22.9		0.050	mg/L	08-JUL-20	09-JUL-20	R5147168
Chromium (Cr)-Total	0.00126		0.00050	mg/L	08-JUL-20	09-JUL-20	R5147168
Copper (Cu)-Total	0.00412		0.00050	mg/L	08-JUL-20	09-JUL-20	R5147168
Iron (Fe)-Total	0.012		0.010	mg/L	08-JUL-20	09-JUL-20	R5147168
Lead (Pb)-Total	0.167		0.050	ug/L	08-JUL-20	09-JUL-20	R5147168
Magnesium (Mg)-Total	9.34		0.0050	mg/L	08-JUL-20	09-JUL-20	R5147168
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		08-JUL-20	R5146097
Nickel (Ni)-Total	0.00253		0.00050	mg/L	08-JUL-20	09-JUL-20	R5147168
Potassium (K)-Total	5.71		0.050	mg/L	08-JUL-20	09-JUL-20	R5147168
Sodium (Na)-Total	16.0		0.050	mg/L	08-JUL-20	09-JUL-20	R5147168
Zinc (Zn)-Total	0.0144		0.0030	mg/L	08-JUL-20	09-JUL-20	R5147168
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	11-JUL-20	11-JUL-20	R5150776
Phenols (4AAP)	17.1		1.0	ug/L		07-JUL-20	R5146145
Volatile Organic Compounds							
Benzene	<0.50		0.50	ug/L		08-JUL-20	R5145832
Ethylbenzene	<0.50		0.50	ug/L		08-JUL-20	R5145832
Toluene	<0.50		0.50	ug/L		08-JUL-20	R5145832
o-Xylene	<0.30		0.30	ug/L		08-JUL-20	R5145832
m+p-Xylenes	<0.40		0.40	ug/L		08-JUL-20	R5145832
Xylenes (Total)	<0.50		0.50	ug/L		08-JUL-20	
Surrogate: 4-Bromofluorobenzene	102.7		70-130	%		08-JUL-20	R5145832
Surrogate: 1,4-Difluorobenzene	104.9		70-130	%		08-JUL-20	R5145832
Hydrocarbons							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HARDNESS-T-CALC-WT	Water	Hardness (as CaCO3), from total Ca/Mg	APHA 2340B

"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total (acid digested) Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.

PAH-CCME-WT	Water	CCME PAHs	SW846 8270

Sample is extracted at neutral pH using separate aliquots of dichloromethane with a modified separatory funnel technique, extracts are then concentrated and analyzed by GC/MSD. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

PH-WT	Water	pH	APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Total	MS-B	L2470196-1
Matrix Spike	Copper (Cu)-Total	MS-B	L2470196-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2470196-1
Matrix Spike	Potassium (K)-Total	MS-B	L2470196-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2470196-1
Matrix Spike	Nitrite (as N)	MS-B	L2470196-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint.

BTX-511-HS-WT	Water	BTEX by Headspace	SW846 8260 (511)

BTX is determined by analyzing by headspace-GC/MS.

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT	Water	Conductivity	APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-N2N3-WT	Water	Calculate from NO2 + NO3	APHA 4110 B
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1□C for a minimum of four hours or until a constant weight is achieved.

TOC-WT	Water	Total Organic Carbon	APHA 5310B

Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L2470196 Report Date: 17-JUL-20

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3W0

Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-WT	Water							
Batch R5152182								
WG3361350-4 DUP		**WG3361350-3**						
Alkalinity, Total (as CaCO3)		360	357		mg/L	0.9	20	13-JUL-20
WG3361350-2 LCS								
Alkalinity, Total (as CaCO3)			99.6		%		85-115	13-JUL-20
WG3361350-1 MB								
Alkalinity, Total (as CaCO3)			<10		mg/L		10	13-JUL-20
BTX-511-HS-WT	Water							
Batch R5145832								
WG3356798-4 DUP		**WG3356798-3**						
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	08-JUL-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	08-JUL-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
WG3356798-1 LCS								
Benzene			102.1		%		70-130	08-JUL-20
Ethylbenzene			93.4		%		70-130	08-JUL-20
m+p-Xylenes			98.2		%		70-130	08-JUL-20
o-Xylene			97.7		%		70-130	08-JUL-20
Toluene			95.5		%		70-130	08-JUL-20
WG3356798-2 MB								
Benzene			<0.50		ug/L		0.5	08-JUL-20
Ethylbenzene			<0.50		ug/L		0.5	08-JUL-20
m+p-Xylenes			<0.40		ug/L		0.4	08-JUL-20
o-Xylene			<0.30		ug/L		0.3	08-JUL-20
Toluene			<0.50		ug/L		0.5	08-JUL-20
Surrogate: 1,4-Difluorobenzene			105.1		%		70-130	08-JUL-20
Surrogate: 4-Bromofluorobenzene			105.3		%		70-130	08-JUL-20
WG3356798-5 MS		**WG3356798-3**						
Benzene			104.3		%		50-140	08-JUL-20
Ethylbenzene			91.1		%		50-140	08-JUL-20
m+p-Xylenes			97.2		%		50-140	08-JUL-20
o-Xylene			95.5		%		50-140	08-JUL-20
Toluene			94.9		%		50-140	08-JUL-20
EC-WT	Water							

Quality Control Report

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3W0

Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WT	Water							
Batch R5145782								
WG3357207-4 DUP		**WG3357207-3**						
Conductivity		1830	1810		umhos/cm	0.9	10	07-JUL-20
WG3357207-2 LCS								
Conductivity			102.6		%		90-110	07-JUL-20
WG3357207-1 MB								
Conductivity			<3.0		umhos/cm		3	07-JUL-20
F1-HS-511-WT	Water							
Batch R5145832								
WG3356798-4 DUP		**WG3356798-3**						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	08-JUL-20
WG3356798-1 LCS								
F1 (C6-C10)			106.9		%		80-120	08-JUL-20
WG3356798-2 MB								
F1 (C6-C10)			<25		ug/L		25	08-JUL-20
Surrogate: 3,4-Dichlorotoluene			110.3		%		60-140	08-JUL-20
WG3356798-5 MS		**WG3356798-3**						
F1 (C6-C10)			102.4		%		60-140	08-JUL-20
F2-F4-511-WT	Water							
Batch R5146714								
WG3357758-2 LCS								
F2 (C10-C16)			102.9		%		70-130	09-JUL-20
F3 (C16-C34)			102.8		%		70-130	09-JUL-20
F4 (C34-C50)			107.6		%		70-130	09-JUL-20
WG3357758-1 MB								
F2 (C10-C16)			<100		ug/L		100	09-JUL-20
F3 (C16-C34)			<250		ug/L		250	09-JUL-20
F4 (C34-C50)			<250		ug/L		250	09-JUL-20
Surrogate: 2-Bromobenzotrifluoride			83.1		%		60-140	09-JUL-20
HG-T-CVAA-WT	Water							
Batch R5146097								
WG3357881-4 DUP		**WG3357881-3**						
Mercury (Hg)-Total		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	08-JUL-20
WG3357881-2 LCS								
Mercury (Hg)-Total			102.0		%		80-120	08-JUL-20
WG3357881-1 MB								
Mercury (Hg)-Total			<0.000005(		mg/L		0.000005	08-JUL-20
WG3357881-6 MS		**WG3357881-5**						

Quality Control Report

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3W0
Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAA-WT	Water							
Batch R5146097								
WG3357881-6 MS		**WG3357881-5**						
Mercury (Hg)-Total			120.1		%		70-130	08-JUL-20
MET-T-CCMS-WT	Water							
Batch R5147168								
WG3357621-4 DUP		**WG3357621-3**						
Aluminum (Al)-Total		0.0073	0.0064		mg/L	13	20	09-JUL-20
Antimony (Sb)-Total		0.00172	0.00174		mg/L	1.3	20	09-JUL-20
Arsenic (As)-Total		0.00337	0.00345		mg/L	2.2	20	09-JUL-20
Cadmium (Cd)-Total		0.0000141	0.0000122		mg/L	14	20	09-JUL-20
Calcium (Ca)-Total		133	135		mg/L	0.9	20	09-JUL-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	09-JUL-20
Copper (Cu)-Total		0.00320	0.00325		mg/L	1.4	20	09-JUL-20
Iron (Fe)-Total		0.026	0.025		mg/L	5.6	20	09-JUL-20
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	09-JUL-20
Magnesium (Mg)-Total		16.2	16.1		mg/L	0.6	20	09-JUL-20
Nickel (Ni)-Total		0.00604	0.00600		mg/L	0.7	20	09-JUL-20
Potassium (K)-Total		26.8	26.8		mg/L	0.2	20	09-JUL-20
Sodium (Na)-Total		61.2	60.9		mg/L	0.5	20	09-JUL-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	09-JUL-20
WG3357621-2 LCS								
Aluminum (Al)-Total			101.8		%		80-120	09-JUL-20
Antimony (Sb)-Total			102.7		%		80-120	09-JUL-20
Arsenic (As)-Total			99.3		%		80-120	09-JUL-20
Cadmium (Cd)-Total			98.3		%		80-120	09-JUL-20
Calcium (Ca)-Total			95.4		%		80-120	09-JUL-20
Chromium (Cr)-Total			100.3		%		80-120	09-JUL-20
Copper (Cu)-Total			98.6		%		80-120	09-JUL-20
Iron (Fe)-Total			100.5		%		80-120	09-JUL-20
Lead (Pb)-Total			96.5		%		80-120	09-JUL-20
Magnesium (Mg)-Total			105.0		%		80-120	09-JUL-20
Nickel (Ni)-Total			98.9		%		80-120	09-JUL-20
Potassium (K)-Total			97.4		%		80-120	09-JUL-20
Sodium (Na)-Total			100.8		%		80-120	09-JUL-20
Zinc (Zn)-Total			97.5		%		80-120	09-JUL-20

ALS Environmental

Quality Control Report

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3W0

Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT	Water							
Batch R5147168								
WG3357621-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	09-JUL-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	09-JUL-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	09-JUL-20
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	09-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	09-JUL-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	09-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	09-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	09-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	09-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	09-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	09-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	09-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	09-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	09-JUL-20
WG3357621-5 MS		**WG3357621-6**						
Aluminum (Al)-Total			98.8		%		70-130	09-JUL-20
Antimony (Sb)-Total			102.1		%		70-130	09-JUL-20
Arsenic (As)-Total			100.2		%		70-130	09-JUL-20
Cadmium (Cd)-Total			95.0		%		70-130	09-JUL-20
Calcium (Ca)-Total			N/A	MS-B	%		-	09-JUL-20
Chromium (Cr)-Total			100.1		%		70-130	09-JUL-20
Copper (Cu)-Total			N/A	MS-B	%		-	09-JUL-20
Iron (Fe)-Total			100.7		%		70-130	09-JUL-20
Lead (Pb)-Total			89.3		%		70-130	09-JUL-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	09-JUL-20
Nickel (Ni)-Total			92.9		%		70-130	09-JUL-20
Potassium (K)-Total			N/A	MS-B	%		-	09-JUL-20
Sodium (Na)-Total			N/A	MS-B	%		-	09-JUL-20
Zinc (Zn)-Total			86.8		%		70-130	09-JUL-20
NH3-F-WT	Water							
Batch R5146185								
WG3357235-3 DUP		**WG3357235-5**						
Ammonia, Total (as N)		0.089	0.089		mg/L	0.2	20	08-JUL-20
WG3357235-2 LCS								

ALS Environmental

Quality Control Report

Workorder: L2470196 Report Date: 17-JUL-20

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3W0

Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-WT	Water							
Batch R5146185								
WG3357235-2 LCS								
Ammonia, Total (as N)			101.5		%		85-115	08-JUL-20
WG3357235-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	08-JUL-20
WG3357235-4 MS		**WG3357235-5**						
Ammonia, Total (as N)			104.5		%		75-125	08-JUL-20
NO2-IC-WT	Water							
Batch R5146287								
WG3357537-14 DUP		**L2468994-2**						
Nitrite (as N)		2.68	2.68		mg/L	0.0	20	07-JUL-20
WG3357537-12 LCS								
Nitrite (as N)			99.7		%		90-110	07-JUL-20
WG3357537-11 MB								
Nitrite (as N)			<0.010		mg/L		0.01	07-JUL-20
WG3357537-15 MS		**L2468994-2**						
Nitrite (as N)			N/A	MS-B	%		-	07-JUL-20
NO3-IC-WT	Water							
Batch R5146287								
WG3357537-14 DUP		**L2468994-2**						
Nitrate (as N)		2.01	2.01		mg/L	0.0	20	07-JUL-20
WG3357537-12 LCS								
Nitrate (as N)			100.3		%		90-110	07-JUL-20
WG3357537-11 MB								
Nitrate (as N)			<0.020		mg/L		0.02	07-JUL-20
WG3357537-15 MS		**L2468994-2**						
Nitrate (as N)			97.7		%		75-125	07-JUL-20
OGG-TOT-WT	Water							
Batch R5150776								
WG3360434-2 LCS								
Oil and Grease, Total			95.9		%		70-130	11-JUL-20
WG3360434-1 MB								
Oil and Grease, Total			<5.0		mg/L		5	11-JUL-20
PAH-CCME-WT	Water							
Batch R5147508								
WG3357758-2 LCS								
1-Methylnaphthalene			99.2		%		50-140	10-JUL-20
2-Methylnaphthalene			96.1		%		50-140	10-JUL-20

Quality Control Report

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3W0
Contact: CAMERON CHADWICK

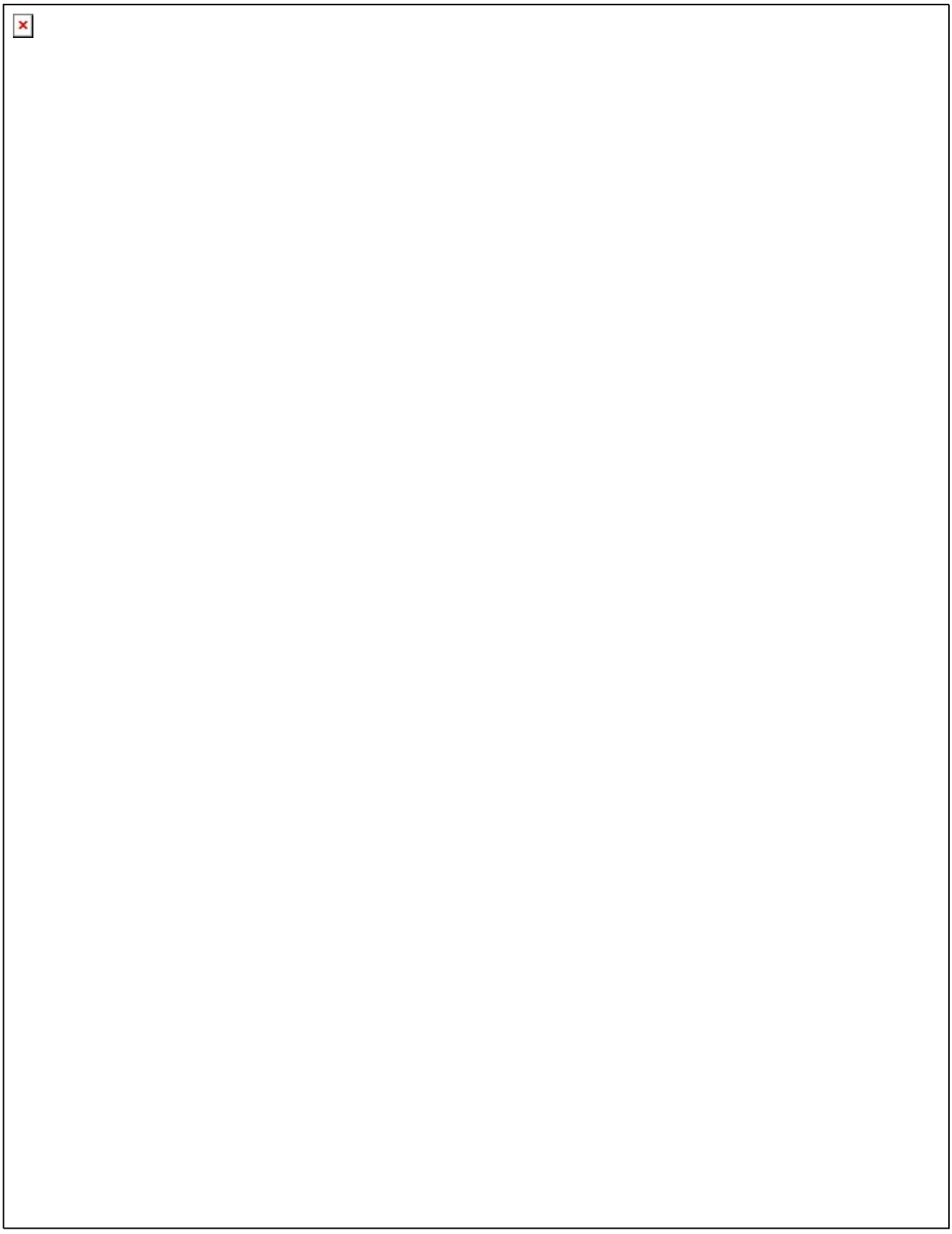
Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-WT	Water							
Batch R5147508								
WG3357758-2 LCS								
Acenaphthene			104.0		%		50-140	10-JUL-20
Acenaphthylene			111.4		%		50-140	10-JUL-20
Acridine			103.0		%		60-130	10-JUL-20
Anthracene			114.6		%		50-140	10-JUL-20
Benzo(a)anthracene			115.3		%		50-140	10-JUL-20
Benzo(a)pyrene			119.2		%		60-130	10-JUL-20
Benzo(b)fluoranthene			114.5		%		50-140	10-JUL-20
Benzo(g,h,i)perylene			121.6		%		50-140	10-JUL-20
Benzo(k)fluoranthene			123.2		%		50-140	10-JUL-20
Chrysene			123.4		%		50-140	10-JUL-20
Dibenzo(ah)anthracene			115.4		%		50-140	10-JUL-20
Fluoranthene			120.4		%		50-140	10-JUL-20
Fluorene			113.1		%		50-140	10-JUL-20
Indeno(1,2,3-cd)pyrene			118.2		%		50-140	10-JUL-20
Naphthalene			102.3		%		50-130	10-JUL-20
Phenanthrene			120.4		%		50-140	10-JUL-20
Pyrene			121.5		%		50-140	10-JUL-20
Quinoline			109.4		%		50-150	10-JUL-20
WG3357758-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	10-JUL-20
2-Methylnaphthalene			<0.020		ug/L		0.02	10-JUL-20
Acenaphthene			<0.020		ug/L		0.02	10-JUL-20
Acenaphthylene			<0.020		ug/L		0.02	10-JUL-20
Acridine			<4.0		ug/L		4	10-JUL-20
Anthracene			<0.020		ug/L		0.02	10-JUL-20
Benzo(a)anthracene			<0.020		ug/L		0.02	10-JUL-20
Benzo(a)pyrene			<0.0050		ug/L		0.005	10-JUL-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	10-JUL-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	10-JUL-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	10-JUL-20
Chrysene			<0.020		ug/L		0.02	10-JUL-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	10-JUL-20
Fluoranthene			<0.020		ug/L		0.02	10-JUL-20
Fluorene			<0.020		ug/L		0.02	10-JUL-20

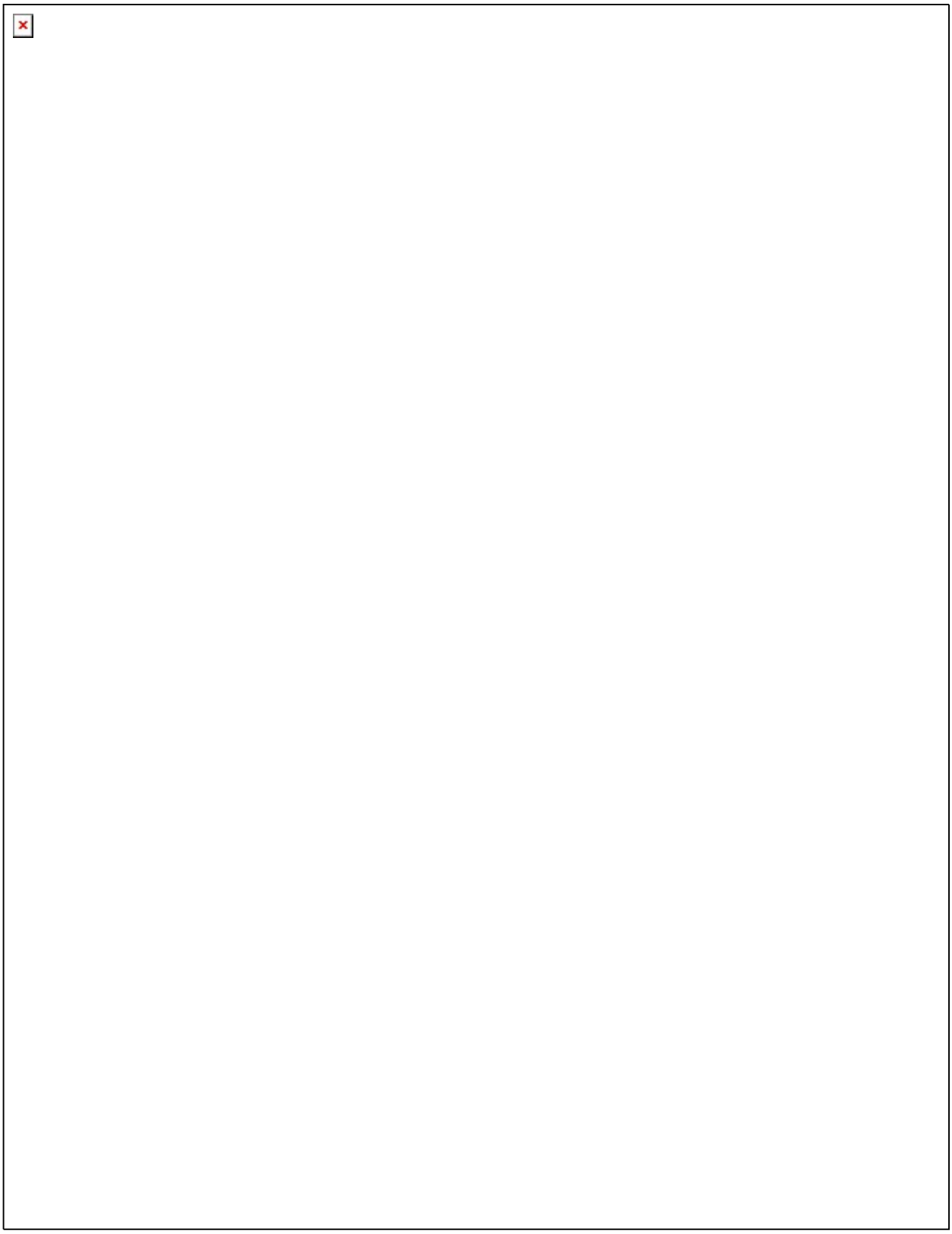
ALS Environmental

Quality Control Report

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3W0
Contact: CAMERON CHADWICK

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-CCME-WT	Water							
Batch R5147508								
WG3357758-1 MB								
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	10-JUL-20
Naphthalene			<0.050		ug/L		0.05	10-JUL-20
Phenanthrene			<0.020		ug/L		0.02	10-JUL-20
Pyrene			<0.020		ug/L		0.02	10-JUL-20
Quinoline			<0.040		ug/L		0.04	10-JUL-20
Surrogate: d8-Naphthalene			94.5		%		60-140	10-JUL-20
Surrogate: d10-Phenanthrene			97.8		%		60-140	10-JUL-20
Surrogate: d12-Chrysene			93.8		%		60-140	10-JUL-20
Surrogate: d10-Acenaphthene			97.1		%		60-140	10-JUL-20
Surrogate: d9-Acridine (SS)			83.5		%		40-130	10-JUL-20
PH-WT	Water							
Batch R5145782								
WG3357207-4 DUP		**WG3357207-3**						
pH		7.78	7.93	J	pH units	0.15	0.2	07-JUL-20
WG3357207-2 LCS								
pH			6.99		pH units		6.9-7.1	07-JUL-20
PHENOLS-4AAP-WT	Water							
Batch R5146145								
WG3357508-3 DUP		**L2470079-1**						
Phenols (4AAP)		0.0017	0.0018		mg/L	4.8	20	07-JUL-20
WG3357508-2 LCS								
Phenols (4AAP)			99.6		%		85-115	07-JUL-20
WG3357508-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	07-JUL-20
WG3357508-4 MS		**L2470079-1**						
Phenols (4AAP)			105.5		%		75-125	07-JUL-20
SO4-IC-N-WT	Water							
Batch R5153924								
WG3362285-4 DUP		**WG3362285-3**						
Sulfate (SO4)		3.29	3.29		mg/L	0.0	20	14-JUL-20
WG3362285-2 LCS								
Sulfate (SO4)			101.1		%		90-110	14-JUL-20
WG3362285-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	14-JUL-20
WG3362285-5 MS		**WG3362285-3**						





Quality Control Report

Workorder: L2470196 Report Date: 17-JUL-20

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3W0

Contact: CAMERON CHADWICK

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Workorder: L2470196 Report Date: 17-JUL-20

Client: Defence Construction Canada
8 WING/CFB TRENTON
ASTRA On K0K 3W0
Contact: CAMERON CHADWICK

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH							
	1	30-JUN-20 14:25	07-JUL-20 00:00	4	6	days	EHTR

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2470196 were received on 07-JUL-20 09:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Defence Construction Canada
ATTN: CAMERON CHADWICK
8 WING/CFB TRENTON
ASTRA On K0K 3W0

Date Received: 07-JUL-20
Report Date: 17-JUL-20 13:21 (MT)
Version: FINAL

Client Phone: 613-392-2811

Certificate of Analysis

Lab Work Order #: L2470201
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Nellie Gudzak
Account Manager

ADDRESS: 190 Colonnade Road, Unit 7, Ottawa, ON K2E 7J5 Canada | Phone: +1 613 225 8279 | Fax: +1 613 225 2801
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2470201-1 ALT-8.1 Sampled By: MCPL AJ MCLAUGHLAN on 30-JUN-20 @ 14:55 Matrix: WATER							
Physical Tests							
Conductivity	197		3.0	umhos/cm		07-JUL-20	R5145782
Hardness (as CaCO3), from total Ca/Mg	75.9		0.50	mg/L		10-JUL-20	
pH	8.13	PEHR	0.10	pH units		07-JUL-20	R5145782
Total Suspended Solids	2.2		2.0	mg/L	07-JUL-20	08-JUL-20	R5146068
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	73		10	mg/L		13-JUL-20	R5152182
Ammonia, Total (as N)	0.045		0.010	mg/L		08-JUL-20	R5146185
Nitrate and Nitrite as N	<0.022		0.022	mg/L		08-JUL-20	
Nitrate (as N)	<0.020		0.020	mg/L		07-JUL-20	R5146287
Nitrite (as N)	<0.010		0.010	mg/L		07-JUL-20	R5146287
Sulfate (SO4)	11.5		0.30	mg/L		14-JUL-20	R5153924
Organic / Inorganic Carbon							
Total Organic Carbon	2.92		0.50	mg/L		14-JUL-20	R5152564
Total Metals							
Aluminum (Al)-Total	0.0198		0.0050	mg/L	08-JUL-20	09-JUL-20	R5147168
Antimony (Sb)-Total	0.00088		0.00010	mg/L	08-JUL-20	09-JUL-20	R5147168
Arsenic (As)-Total	0.00307		0.00010	mg/L	08-JUL-20	09-JUL-20	R5147168
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	08-JUL-20	09-JUL-20	R5147168
Calcium (Ca)-Total	22.2		0.050	mg/L	08-JUL-20	09-JUL-20	R5147168
Chromium (Cr)-Total	0.00051		0.00050	mg/L	08-JUL-20	09-JUL-20	R5147168
Copper (Cu)-Total	0.00223		0.00050	mg/L	08-JUL-20	09-JUL-20	R5147168
Iron (Fe)-Total	0.015		0.010	mg/L	08-JUL-20	09-JUL-20	R5147168
Lead (Pb)-Total	0.068		0.050	ug/L	08-JUL-20	09-JUL-20	R5147168
Magnesium (Mg)-Total	4.96		0.0050	mg/L	08-JUL-20	09-JUL-20	R5147168
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		08-JUL-20	R5146097
Nickel (Ni)-Total	0.00150		0.00050	mg/L	08-JUL-20	09-JUL-20	R5147168
Potassium (K)-Total	2.44		0.050	mg/L	08-JUL-20	09-JUL-20	R5147168
Sodium (Na)-Total	4.46		0.050	mg/L	08-JUL-20	09-JUL-20	R5147168
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	08-JUL-20	09-JUL-20	R5147168
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	12-JUL-20	13-JUL-20	R5150820
Phenols (4AAP)	30.4		1.0	ug/L		07-JUL-20	R5146145
Volatile Organic Compounds							
Benzene	<0.50		0.50	ug/L		08-JUL-20	R5145832
Ethylbenzene	<0.50		0.50	ug/L		08-JUL-20	R5145832
Toluene	<0.50		0.50	ug/L		08-JUL-20	R5145832
o-Xylene	<0.30		0.30	ug/L		08-JUL-20	R5145832
m+p-Xylenes	<0.40		0.40	ug/L		08-JUL-20	R5145832
Xylenes (Total)	<0.50		0.50	ug/L		08-JUL-20	
Surrogate: 4-Bromofluorobenzene	98.0		70-130	%		08-JUL-20	R5145832
Surrogate: 1,4-Difluorobenzene	101.9		70-130	%		08-JUL-20	R5145832
Hydrocarbons							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2470201-1 ALT-8.1 Sampled By: MCPL AJ MCLAUGHLAN on 30-JUN-20 @ 14:55 Matrix: WATER							
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		08-JUL-20	R5145832
F1-BTEX	<25		25	ug/L		10-JUL-20	
F2 (C10-C16)	<100		100	ug/L	08-JUL-20	09-JUL-20	R5146714
F2-Naphth	<100		100	ug/L		10-JUL-20	
F3 (C16-C34)	<250		250	ug/L	08-JUL-20	09-JUL-20	R5146714
F3-PAH	<250		250	ug/L		10-JUL-20	
F4 (C34-C50)	<250		250	ug/L	08-JUL-20	09-JUL-20	R5146714
Total Hydrocarbons (C6-C50)	<370		370	ug/L		10-JUL-20	
Chrom. to baseline at nC50	YES				08-JUL-20	09-JUL-20	R5146714
Surrogate: 2-Bromobenzotrifluoride	84.8		60-140	%	08-JUL-20	09-JUL-20	R5146714
Surrogate: 3,4-Dichlorotoluene	101.6		60-140	%		08-JUL-20	R5145832
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Acenaphthylene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Acridine	<4.0		4.0	ug/L	08-JUL-20	10-JUL-20	R5147508
Anthracene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Benzo(a)anthracene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Benzo(a)pyrene	<0.0050		0.0050	ug/L	08-JUL-20	10-JUL-20	R5147508
Benzo(b)fluoranthene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Benzo(k)fluoranthene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Chrysene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Fluoranthene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Fluorene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		10-JUL-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
2-Methylnaphthalene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Naphthalene	<0.050		0.050	ug/L	08-JUL-20	10-JUL-20	R5147508
Phenanthrene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Pyrene	<0.020		0.020	ug/L	08-JUL-20	10-JUL-20	R5147508
Quinoline	<0.040		0.040	ug/L	08-JUL-20	10-JUL-20	R5147508
Surrogate: d10-Acenaphthene	93.7		60-140	%	08-JUL-20	10-JUL-20	R5147508
Surrogate: d9-Acridine (SS)	81.6		40-130	%	08-JUL-20	10-JUL-20	R5147508
Surrogate: d12-Chrysene	85.1		60-140	%	08-JUL-20	10-JUL-20	R5147508
Surrogate: d8-Naphthalene	91.9		60-140	%	08-JUL-20	10-JUL-20	R5147508
Surrogate: d10-Phenanthrene	93.9		60-140	%	08-JUL-20	10-JUL-20	R5147508
B(a)P Total Potency Equivalent	<0.060		0.060	ug/L	08-JUL-20	10-JUL-20	R5147508

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Total	MS-B	L2470201-1
Matrix Spike	Copper (Cu)-Total	MS-B	L2470201-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2470201-1
Matrix Spike	Potassium (K)-Total	MS-B	L2470201-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2470201-1
Matrix Spike	Nitrite (as N)	MS-B	L2470201-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt. Proceed With Analysis As Requested.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint.

BTX-511-HS-WT	Water	BTEX by Headspace	SW846 8260 (511)

BTX is determined by analyzing by headspace-GC/MS.

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT	Water	Conductivity	APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-N2N3-WT	Water	Calculate from NO2 + NO3	APHA 4110 B
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HARDNESS-T-CALC-WT	Water	Hardness (as CaCO3), from total Ca/Mg	APHA 2340B

"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total (acid digested) Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.

PAH-CCME-WT	Water	CCME PAHs	SW846 8270

Sample is extracted at neutral pH using separate aliquots of dichloromethane with a modified separatory funnel technique, extracts are then concentrated and analyzed by GC/MSD. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

PH-WT	Water	pH	APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Reference Information

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1□C for a minimum of four hours or until a constant weight is achieved.

TOC-WT	Water	Total Organic Carbon	APHA 5310B

Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Defence Construction Canada
ATTN: CAMERON CHADWICK
8 WING / CFB TRENTON
ASTRA On N0K3W0

Date Received: 17-JUL-20
Report Date: 24-JUL-20 15:08 (MT)
Version: FINAL

Client Phone: 613-392-2811

Certificate of Analysis

Lab Work Order #: L2475776
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

N. Gudzak

Nellie Gudzak
Account Manager

ADDRESS: 190 Colonnade Road, Unit 7, Ottawa, ON K2E 7J5 Canada | Phone: +1 613 225 8279 | Fax: +1 613 225 2801
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2475776-1 ALT 2 Sampled By: CLIENT on 15-JUL-20 @ 11:00 Matrix: WATER							
Physical Tests							
Conductivity	459		3.0	umhos/cm		18-JUL-20	R5158756
Hardness (as CaCO3), from total Ca/Mg	171		1.3	mg/L		21-JUL-20	
pH	7.40		0.10	pH units		18-JUL-20	R5158756
Total Suspended Solids	374	DLHC	4.0	mg/L	22-JUL-20	23-JUL-20	R5163642
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	158		10	mg/L		18-JUL-20	R5158756
Ammonia, Total (as N)	7.15	DLHC	0.50	mg/L		22-JUL-20	R5161939
Chloride (Cl)	37.6		0.50	mg/L		21-JUL-20	R5162788
Nitrate and Nitrite as N	<0.022		0.022	mg/L		22-JUL-20	
Nitrate (as N)	<0.020		0.020	mg/L		21-JUL-20	R5162788
Nitrite (as N)	<0.010		0.010	mg/L		21-JUL-20	R5162788
Sulfate (SO4)	7.73		0.30	mg/L		21-JUL-20	R5162788
Organic / Inorganic Carbon							
Total Organic Carbon	114	DLM	10	mg/L		22-JUL-20	R5165617
Bacteriological Tests							
Fecal Coliforms	650000	PEHT	10000	CFU/100mL		17-JUL-20	R5157653
Total Metals							
Aluminum (Al)-Total	3.15	DLHC	0.050	mg/L	19-JUL-20	20-JUL-20	R5158356
Antimony (Sb)-Total	<0.0010	DLHC	0.0010	mg/L	19-JUL-20	20-JUL-20	R5158356
Arsenic (As)-Total	0.0089	DLHC	0.0010	mg/L	19-JUL-20	20-JUL-20	R5158356
Cadmium (Cd)-Total	0.000109	DLHC	0.000050	mg/L	19-JUL-20	20-JUL-20	R5158356
Calcium (Ca)-Total	50.3	DLHC	0.50	mg/L	19-JUL-20	20-JUL-20	R5158356
Chromium (Cr)-Total	0.0062	DLHC	0.0050	mg/L	19-JUL-20	20-JUL-20	R5158356
Copper (Cu)-Total	0.0620	DLHC	0.0050	mg/L	19-JUL-20	20-JUL-20	R5158356
Iron (Fe)-Total	6.56	DLHC	0.10	mg/L	19-JUL-20	20-JUL-20	R5158356
Lead (Pb)-Total	5.78	DLHC	0.50	ug/L	19-JUL-20	20-JUL-20	R5158356
Magnesium (Mg)-Total	11.0	DLHC	0.050	mg/L	19-JUL-20	20-JUL-20	R5158356
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		20-JUL-20	R5158627
Nickel (Ni)-Total	0.0330	DLHC	0.0050	mg/L	19-JUL-20	20-JUL-20	R5158356
Potassium (K)-Total	6.17	DLHC	0.50	mg/L	19-JUL-20	20-JUL-20	R5158356
Sodium (Na)-Total	29.3	DLHC	0.50	mg/L	19-JUL-20	20-JUL-20	R5158356
Zinc (Zn)-Total	0.038	DLHC	0.030	mg/L	19-JUL-20	20-JUL-20	R5158356
Aggregate Organics							
BOD	18		10	mg/L		18-JUL-20	R5165139
Oil and Grease, Total	5.5		5.0	mg/L	21-JUL-20	21-JUL-20	R5160251
Phenols (4AAP)	8.9	SP	1.0	ug/L		17-JUL-20	R5158557
L2475776-2 ALT 3 Sampled By: CLIENT on 15-JUL-20 @ 11:00 Matrix: WATER							
Physical Tests							
Conductivity	462		3.0	umhos/cm		18-JUL-20	R5158756
Hardness (as CaCO3), from total Ca/Mg	209		1.3	mg/L		21-JUL-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2475776-2 ALT 3 Sampled By: CLIENT on 15-JUL-20 @ 11:00 Matrix: WATER							
Physical Tests							
pH	7.27		0.10	pH units		18-JUL-20	R5158756
Total Suspended Solids	371	DLHC	4.0	mg/L	22-JUL-20	23-JUL-20	R5163642
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	158		10	mg/L		18-JUL-20	R5158756
Ammonia, Total (as N)	6.54	DLHC	0.50	mg/L		22-JUL-20	R5161939
Chloride (Cl)	37.6		0.50	mg/L		21-JUL-20	R5162788
Nitrate and Nitrite as N	<0.022		0.022	mg/L		22-JUL-20	
Nitrate (as N)	<0.020		0.020	mg/L		21-JUL-20	R5162788
Nitrite (as N)	<0.010		0.010	mg/L		21-JUL-20	R5162788
Sulfate (SO4)	7.88		0.30	mg/L		21-JUL-20	R5162788
Organic / Inorganic Carbon							
Total Organic Carbon	133	DLM	10	mg/L		22-JUL-20	R5165617
Bacteriological Tests							
Fecal Coliforms	480000	PEHT	10000	CFU/100mL		17-JUL-20	R5157653
Total Metals							
Aluminum (Al)-Total	4.43	DLHC	0.050	mg/L	19-JUL-20	20-JUL-20	R5158356
Antimony (Sb)-Total	<0.0010	DLHC	0.0010	mg/L	19-JUL-20	20-JUL-20	R5158356
Arsenic (As)-Total	0.0101	DLHC	0.0010	mg/L	19-JUL-20	20-JUL-20	R5158356
Cadmium (Cd)-Total	0.000101	DLHC	0.000050	mg/L	19-JUL-20	20-JUL-20	R5158356
Calcium (Ca)-Total	62.9	DLHC	0.50	mg/L	19-JUL-20	20-JUL-20	R5158356
Chromium (Cr)-Total	0.0089	DLHC	0.0050	mg/L	19-JUL-20	20-JUL-20	R5158356
Copper (Cu)-Total	0.0681	DLHC	0.0050	mg/L	19-JUL-20	20-JUL-20	R5158356
Iron (Fe)-Total	9.24	DLHC	0.10	mg/L	19-JUL-20	20-JUL-20	R5158356
Lead (Pb)-Total	7.85	DLHC	0.50	ug/L	19-JUL-20	20-JUL-20	R5158356
Magnesium (Mg)-Total	12.7	DLHC	0.050	mg/L	19-JUL-20	20-JUL-20	R5158356
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		20-JUL-20	R5158627
Nickel (Ni)-Total	0.0383	DLHC	0.0050	mg/L	19-JUL-20	20-JUL-20	R5158356
Potassium (K)-Total	6.23	DLHC	0.50	mg/L	19-JUL-20	20-JUL-20	R5158356
Sodium (Na)-Total	29.0	DLHC	0.50	mg/L	19-JUL-20	20-JUL-20	R5158356
Zinc (Zn)-Total	0.035	DLHC	0.030	mg/L	19-JUL-20	20-JUL-20	R5158356
Aggregate Organics							
BOD	19		10	mg/L		18-JUL-20	R5165139
Oil and Grease, Total	<5.0		5.0	mg/L	21-JUL-20	21-JUL-20	R5160251
Phenols (4AAP)	9.4	SP	1.0	ug/L		17-JUL-20	R5158557

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Total	MS-B	L2475776-1, -2
Matrix Spike	Iron (Fe)-Total	MS-B	L2475776-1, -2
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2475776-1, -2
Matrix Spike	Potassium (K)-Total	MS-B	L2475776-1, -2
Matrix Spike	Sodium (Na)-Total	MS-B	L2475776-1, -2

Sample Parameter Qualifier key listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis
SP	Sample was Preserved at the laboratory

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint.

BOD-WT	Water	BOD	APHA 5210 B

This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT	Water	Conductivity	APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-N2N3-WT	Water	Calculate from NO2 + NO3	APHA 4110 B

FC-MF-WT	Water	Fecal Coliforms	SM 9222D

A 100mL volume of sample is filtered through a membrane, the membrane is placed on mFC agar and incubated at 24-2h@44.5-0.2℃. Method ID: WT-TM-1200

HARDNESS-T-CALC-WT	Water	Hardness (as CaCO3), from total Ca/Mg	APHA 2340B

"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total (acid digested) Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Reference Information

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.

PH-WT	Water	pH	APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1□C for a minimum of four hours or until a constant weight is achieved.

TOC-WT	Water	Total Organic Carbon	APHA 5310B

Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Defence Construction Canada
ATTN: CAMERON CHADWICK
780 Midpark Drive
Suit 205
Kingston On K7M7P6

Date Received: 27-JUL-20
Report Date: 04-AUG-20 16:20 (MT)
Version: FINAL

Client Phone: 613-384-1256

Certificate of Analysis

Lab Work Order #: L2479847
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

N. Gudzak

Nellie Gudzak
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2479847-1 ALT-4 Sampled By: A.J Mclanghlan on 20-JUL-20 @ 14:05 Matrix: WATER							
Physical Tests							
Conductivity	230		3.0	umhos/cm		29-JUL-20	R5172171
Hardness (as CaCO3)	123	HTC	1.3	mg/L		29-JUL-20	
pH	8.12		0.10	pH units		29-JUL-20	R5172171
Total Suspended Solids	179	DLHC	20	mg/L	27-JUL-20	28-JUL-20	R5168533
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	70		10	mg/L		29-JUL-20	R5172171
Ammonia, Total (as N)	<0.010		0.010	mg/L		31-JUL-20	R5173787
Nitrate and Nitrite as N	0.115		0.022	mg/L		28-JUL-20	
Nitrate (as N)	0.115		0.020	mg/L		27-JUL-20	R5169501
Nitrite (as N)	<0.010		0.010	mg/L		27-JUL-20	R5169501
Sulfate (SO4)	21.6		0.30	mg/L		27-JUL-20	R5169501
Organic / Inorganic Carbon							
Total Organic Carbon	46	DLM	10	mg/L		30-JUL-20	R5171946
Total Metals							
Aluminum (Al)-Total	6.74		0.0050	mg/L	28-JUL-20	29-JUL-20	R5168380
Antimony (Sb)-Total	0.00298		0.00010	mg/L	28-JUL-20	29-JUL-20	R5168380
Arsenic (As)-Total	0.0131		0.00010	mg/L	28-JUL-20	29-JUL-20	R5168380
Cadmium (Cd)-Total	0.0000800		0.0000050	mg/L	28-JUL-20	29-JUL-20	R5168380
Calcium (Ca)-Total	33.3		0.50	mg/L	28-JUL-20	29-JUL-20	R5168380
Chromium (Cr)-Total	0.0122		0.00050	mg/L	28-JUL-20	29-JUL-20	R5168380
Copper (Cu)-Total	0.0236		0.0010	mg/L	28-JUL-20	29-JUL-20	R5168380
Iron (Fe)-Total	11.5		0.010	mg/L	28-JUL-20	29-JUL-20	R5168380
Lead (Pb)-Total	12.2		0.050	ug/L	28-JUL-20	29-JUL-20	R5168380
Magnesium (Mg)-Total	9.76		0.050	mg/L	28-JUL-20	29-JUL-20	R5168380
Mercury (Hg)-Total	0.0000339		0.0000050	mg/L		29-JUL-20	R5171368
Nickel (Ni)-Total	0.0292		0.00050	mg/L	28-JUL-20	29-JUL-20	R5168380
Potassium (K)-Total	2.96		0.050	mg/L	28-JUL-20	29-JUL-20	R5168380
Sodium (Na)-Total	8.37		0.050	mg/L	28-JUL-20	29-JUL-20	R5168380
Zinc (Zn)-Total	0.0616		0.0030	mg/L	28-JUL-20	29-JUL-20	R5168380
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	27-JUL-20	27-JUL-20	R5168043
Phenols (4AAP)	<5.0	RRR	5.0	ug/L		27-JUL-20	R5168525
Report Remarks : Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity)., Sample was Preserved at the laboratory							

* Refer to Referenced Information for Qualifiers (if any) and Methodology

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Total	MS-B	L2479847-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2479847-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2479847-1
Matrix Spike	Potassium (K)-Total	MS-B	L2479847-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2479847-1
Matrix Spike	Ammonia, Total (as N)	MS-B	L2479847-1
Matrix Spike	Phenols (4AAP)	MS-B	L2479847-1

Sample Parameter Qualifier key listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint.

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT	Water	Conductivity	APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-N2N3-WT	Water	Calculate from NO2 + NO3	APHA 4110 B
HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Reference Information

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.

PH-WT	Water	pH	APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1℃ for a minimum of four hours or until a constant weight is achieved.

TOC-WT	Water	Total Organic Carbon	APHA 5310B

Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Defence Construction Canada
ATTN: CAMERON CHADWICK
780 Midpark Drive
Suit 205
Kingston On K7M7P6

Date Received: 27-JUL-20
Report Date: 04-AUG-20 16:22 (MT)
Version: FINAL

Client Phone: 613-384-1256

Certificate of Analysis

Lab Work Order #: L2479852
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

N. Gudzak

Nellie Gudzak
Account Manager

8AC-ALT1929-2020

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2479852-1 ALT-8-1 Sampled By: A.J Mclanghlan on 20-JUL-20 @ 13:45 Matrix: WATER							
Physical Tests							
Conductivity	207		3.0	umhos/cm		29-JUL-20	R5172171
Hardness (as CaCO3)	80.4	HTC	1.3	mg/L		29-JUL-20	
pH	8.17		0.10	pH units		29-JUL-20	R5172171
Total Suspended Solids	14.7		2.0	mg/L	27-JUL-20	28-JUL-20	R5168533
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	73		10	mg/L		29-JUL-20	R5172171
Ammonia, Total (as N)	0.015		0.010	mg/L		30-JUL-20	R5172181
Nitrate and Nitrite as N	<0.022		0.022	mg/L		28-JUL-20	
Nitrate (as N)	<0.020		0.020	mg/L		27-JUL-20	R5169501
Nitrite (as N)	<0.010		0.010	mg/L		27-JUL-20	R5169501
Sulfate (SO4)	14.4		0.30	mg/L		27-JUL-20	R5169501
Organic / Inorganic Carbon							
Total Organic Carbon	2.14		0.50	mg/L		30-JUL-20	R5171946
Total Metals							
Aluminum (Al)-Total	0.0099		0.0050	mg/L	28-JUL-20	29-JUL-20	R5168380
Antimony (Sb)-Total	0.00108		0.00010	mg/L	28-JUL-20	29-JUL-20	R5168380
Arsenic (As)-Total	0.00289		0.00010	mg/L	28-JUL-20	29-JUL-20	R5168380
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	28-JUL-20	29-JUL-20	R5168380
Calcium (Ca)-Total	22.2		0.50	mg/L	28-JUL-20	29-JUL-20	R5168380
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	28-JUL-20	29-JUL-20	R5168380
Copper (Cu)-Total	0.0027		0.0010	mg/L	28-JUL-20	29-JUL-20	R5168380
Iron (Fe)-Total	<0.010		0.010	mg/L	28-JUL-20	29-JUL-20	R5168380
Lead (Pb)-Total	0.061		0.050	ug/L	28-JUL-20	29-JUL-20	R5168380
Magnesium (Mg)-Total	6.04		0.050	mg/L	28-JUL-20	29-JUL-20	R5168380
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		29-JUL-20	R5171368
Nickel (Ni)-Total	0.00143		0.00050	mg/L	28-JUL-20	29-JUL-20	R5168380
Potassium (K)-Total	3.09		0.050	mg/L	28-JUL-20	29-JUL-20	R5168380
Sodium (Na)-Total	5.09		0.050	mg/L	28-JUL-20	29-JUL-20	R5168380
Zinc (Zn)-Total	0.0036		0.0030	mg/L	28-JUL-20	29-JUL-20	R5168380
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	27-JUL-20	27-JUL-20	R5168043
Phenols (4AAP)	15.1		1.0	ug/L		27-JUL-20	R5168525
Volatile Organic Compounds							
Benzene	<0.50		0.50	ug/L		28-JUL-20	R5168089
Ethylbenzene	<0.50		0.50	ug/L		28-JUL-20	R5168089
Toluene	<0.50		0.50	ug/L		28-JUL-20	R5168089
o-Xylene	<0.30		0.30	ug/L		28-JUL-20	R5168089
m+p-Xylenes	<0.40		0.40	ug/L		28-JUL-20	R5168089
Xylenes (Total)	<0.50		0.50	ug/L		28-JUL-20	
Surrogate: 4-Bromofluorobenzene	99.0		70-130	%		28-JUL-20	R5168089
Surrogate: 1,4-Difluorobenzene	99.7		70-130	%		28-JUL-20	R5168089
Hydrocarbons							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2479852-1 ALT-8-1 Sampled By: A.J Mclanghlan on 20-JUL-20 @ 13:45 Matrix: WATER							
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		28-JUL-20	R5168089
F1-BTEX	<25		25	ug/L		31-JUL-20	
F2 (C10-C16)	<100		100	ug/L	28-JUL-20	29-JUL-20	R5170836
F2-Naphth	<100		100	ug/L		31-JUL-20	
F3 (C16-C34)	<250		250	ug/L	28-JUL-20	29-JUL-20	R5170836
F3-PAH	<250		250	ug/L		31-JUL-20	
F4 (C34-C50)	<250		250	ug/L	28-JUL-20	29-JUL-20	R5170836
Total Hydrocarbons (C6-C50)	<370		370	ug/L		31-JUL-20	
Chrom. to baseline at nC50	YES				28-JUL-20	29-JUL-20	R5170836
Surrogate: 2-Bromobenzotrifluoride	84.6		60-140	%	28-JUL-20	29-JUL-20	R5170836
Surrogate: 3,4-Dichlorotoluene	98.3		60-140	%		28-JUL-20	R5168089
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Acenaphthylene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Acridine	<4.0		4.0	ug/L	28-JUL-20	31-JUL-20	R5170358
Anthracene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Benzo(a)anthracene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Benzo(a)pyrene	<0.0050		0.0050	ug/L	28-JUL-20	31-JUL-20	R5170358
Benzo(b)fluoranthene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Benzo(k)fluoranthene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Chrysene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Fluoranthene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Fluorene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		31-JUL-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
2-Methylnaphthalene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Naphthalene	<0.050		0.050	ug/L	28-JUL-20	31-JUL-20	R5170358
Phenanthrene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Pyrene	<0.020		0.020	ug/L	28-JUL-20	31-JUL-20	R5170358
Quinoline	<0.040		0.040	ug/L	28-JUL-20	31-JUL-20	R5170358
Surrogate: d10-Acenaphthene	95.9		60-140	%	28-JUL-20	31-JUL-20	R5170358
Surrogate: d9-Acridine (SS)	104.6		40-130	%	28-JUL-20	31-JUL-20	R5170358
Surrogate: d12-Chrysene	97.5		60-140	%	28-JUL-20	31-JUL-20	R5170358
Surrogate: d8-Naphthalene	84.8		60-140	%	28-JUL-20	31-JUL-20	R5170358
Surrogate: d10-Phenanthrene	104.5		60-140	%	28-JUL-20	31-JUL-20	R5170358
B(a)P Total Potency Equivalent	<0.060		0.060	ug/L	28-JUL-20	31-JUL-20	R5170358

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Total	MS-B	L2479852-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2479852-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2479852-1
Matrix Spike	Potassium (K)-Total	MS-B	L2479852-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2479852-1
Matrix Spike	Phenols (4AAP)	MS-B	L2479852-1

Sample Parameter Qualifier key listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint.

BTX-511-HS-WT	Water	BTEX by Headspace	SW846 8260 (511)

BTX is determined by analyzing by headspace-GC/MS.

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT	Water	Conductivity	APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-N2N3-WT	Water	Calculate from NO2 + NO3	APHA 4110 B
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.

PAH-CCME-WT	Water	CCME PAHs	SW846 8270

Sample is extracted at neutral pH using separate aliquots of dichloromethane with a modified separatory funnel technique, extracts are then concentrated and analyzed by GC/MSD. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

PH-WT	Water	pH	APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104-1□C for a minimum of four hours or until a constant weight is achieved.

TOC-WT	Water	Total Organic Carbon	APHA 5310B

Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

Reference Information

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Defence Construction Canada
ATTN: CAMERON CHADWICK
780 Midpark Drive
Suit 205
Kingston On K7M7P6

Date Received: 27-JUL-20
Report Date: 12-AUG-20 14:25 (MT)
Version: FINAL

Client Phone: 613-384-1256

Certificate of Analysis

Lab Work Order #: L2479856
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

N. Gudzak

Nellie Gudzak
Account Manager

8AC-ALT1929-2020

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2479856-1 ALT-9 Sampled By: A.J Mclanghlan on 20-JUL-20 @ 13:30 Matrix: WATER							
Physical Tests							
Conductivity	193		3.0	umhos/cm		29-JUL-20	R5172171
Hardness (as CaCO3)	75.7	HTC	1.3	mg/L		29-JUL-20	
pH	8.17		0.10	pH units		29-JUL-20	R5172171
Total Suspended Solids	2.1		2.0	mg/L	27-JUL-20	28-JUL-20	R5168533
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	74		10	mg/L		29-JUL-20	R5172171
Ammonia, Total (as N)	0.020		0.010	mg/L		30-JUL-20	R5172181
Nitrate and Nitrite as N	<0.022		0.022	mg/L		28-JUL-20	
Nitrate (as N)	<0.020		0.020	mg/L		27-JUL-20	R5169501
Nitrite (as N)	<0.010		0.010	mg/L		27-JUL-20	R5169501
Sulfate (SO4)	8.94		0.30	mg/L		27-JUL-20	R5169501
Organic / Inorganic Carbon							
Total Organic Carbon	1.44		0.50	mg/L		30-JUL-20	R5171946
Total Metals							
Aluminum (Al)-Total	0.0129		0.0050	mg/L	28-JUL-20	29-JUL-20	R5168380
Antimony (Sb)-Total	0.00070		0.00010	mg/L	28-JUL-20	29-JUL-20	R5168380
Arsenic (As)-Total	0.00193		0.00010	mg/L	28-JUL-20	29-JUL-20	R5168380
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	28-JUL-20	29-JUL-20	R5168380
Calcium (Ca)-Total	22.4		0.50	mg/L	28-JUL-20	29-JUL-20	R5168380
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	28-JUL-20	29-JUL-20	R5168380
Copper (Cu)-Total	<0.0010		0.0010	mg/L	28-JUL-20	29-JUL-20	R5168380
Iron (Fe)-Total	0.018		0.010	mg/L	28-JUL-20	29-JUL-20	R5168380
Lead (Pb)-Total	0.075		0.050	ug/L	28-JUL-20	29-JUL-20	R5168380
Magnesium (Mg)-Total	4.80		0.050	mg/L	28-JUL-20	29-JUL-20	R5168380
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		29-JUL-20	R5171368
Nickel (Ni)-Total	0.00093		0.00050	mg/L	28-JUL-20	29-JUL-20	R5168380
Potassium (K)-Total	1.94		0.050	mg/L	28-JUL-20	29-JUL-20	R5168380
Sodium (Na)-Total	6.56		0.050	mg/L	28-JUL-20	29-JUL-20	R5168380
Zinc (Zn)-Total	0.0053		0.0030	mg/L	28-JUL-20	29-JUL-20	R5168380
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		29-JUL-20	R5171924
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	27-JUL-20	27-JUL-20	R5168043
Phenols (4AAP)	27.9		1.0	ug/L		27-JUL-20	R5168525
Volatile Organic Compounds							
Benzene	<0.50		0.50	ug/L		28-JUL-20	R5168089
Ethylbenzene	<0.50		0.50	ug/L		28-JUL-20	R5168089
Toluene	<0.50		0.50	ug/L		28-JUL-20	R5168089
o-Xylene	<0.30		0.30	ug/L		28-JUL-20	R5168089
m+p-Xylenes	<0.40		0.40	ug/L		28-JUL-20	R5168089
Xylenes (Total)	<0.50		0.50	ug/L		28-JUL-20	
Surrogate: 4-Bromofluorobenzene	99.9		70-130	%		28-JUL-20	R5168089

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2479856-1 ALT-9 Sampled By: A.J Mclanghlan on 20-JUL-20 @ 13:30 Matrix: WATER							
Volatile Organic Compounds							
Surrogate: 1,4-Difluorobenzene	99.5		70-130	%		28-JUL-20	R5168089
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		28-JUL-20	R5168089
F1-BTEX	<25		25	ug/L		07-AUG-20	
F2 (C10-C16)	<100		100	ug/L	27-JUL-20	28-JUL-20	R5169697
F2-Naphth	<100		100	ug/L		07-AUG-20	
F3 (C16-C34)	<250		250	ug/L	27-JUL-20	28-JUL-20	R5169697
F3-PAH	<250		250	ug/L		07-AUG-20	
F4 (C34-C50)	<250		250	ug/L	27-JUL-20	28-JUL-20	R5169697
Total Hydrocarbons (C6-C50)	<370		370	ug/L		07-AUG-20	
Chrom. to baseline at nC50	YES				27-JUL-20	28-JUL-20	R5169697
Surrogate: 2-Bromobenzotrifluoride	87.6		60-140	%	27-JUL-20	28-JUL-20	R5169697
Surrogate: 3,4-Dichlorotoluene	97.1		60-140	%		28-JUL-20	R5168089
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Acenaphthylene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Acridine	<4.0		4.0	ug/L	27-JUL-20	07-AUG-20	R5171505
Anthracene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Benzo(a)anthracene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Benzo(a)pyrene	<0.0050		0.0050	ug/L	27-JUL-20	07-AUG-20	R5171505
Benzo(b)fluoranthene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Benzo(k)fluoranthene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Chrysene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Fluoranthene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Fluorene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		07-AUG-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
2-Methylnaphthalene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Naphthalene	<0.050		0.050	ug/L	27-JUL-20	07-AUG-20	R5171505
Phenanthrene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Pyrene	<0.020		0.020	ug/L	27-JUL-20	07-AUG-20	R5171505
Quinoline	<0.040		0.040	ug/L	27-JUL-20	07-AUG-20	R5171505
Surrogate: d10-Acenaphthene	86.1		60-140	%	27-JUL-20	07-AUG-20	R5171505
Surrogate: d9-Acridine (SS)	83.9		40-130	%	27-JUL-20	07-AUG-20	R5171505
Surrogate: d12-Chrysene	79.9		60-140	%	27-JUL-20	07-AUG-20	R5171505
Surrogate: d8-Naphthalene	90.5		60-140	%	27-JUL-20	07-AUG-20	R5171505
Surrogate: d10-Phenanthrene	83.7		60-140	%	27-JUL-20	07-AUG-20	R5171505
B(a)P Total Potency Equivalent	<0.060		0.060	ug/L	27-JUL-20	07-AUG-20	R5171505

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Quinoline	MB-LOR	L2479856-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2479856-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2479856-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2479856-1
Matrix Spike	Potassium (K)-Total	MS-B	L2479856-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2479856-1
Matrix Spike	Phenols (4AAP)	MS-B	L2479856-1

Sample Parameter Qualifier key listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint.

BTX-511-HS-WT	Water	BTEX by Headspace	SW846 8260 (511)

BTX is determined by analyzing by headspace-GC/MS.

CR-CR6-IC-WT	Water	Chromium +6	EPA 7199

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT	Water	Conductivity	APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-N2N3-WT	Water	Calculate from NO2 + NO3	APHA 4110 B

F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.

Reference Information

2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the "Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil - Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.

PAH-CCME-WT	Water	CCME PAHs	SW846 8270

Sample is extracted at neutral pH using separate aliquots of dichloromethane with a modified separatory funnel technique, extracts are then concentrated and analyzed by GC/MSD. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

PH-WT	Water	pH	APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Reference Information

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104-1□C for a minimum of four hours or until a constant weight is achieved.

TOC-WT	Water	Total Organic Carbon	APHA 5310B

Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Defence Construction Canada
ATTN: CAMERON CHADWICK
8 WING/CFB TRENTON
ASTRA On K0K 3W0

Date Received: 05-AUG-20
Report Date: 12-AUG-20 12:29 (MT)
Version: FINAL

Client Phone: 613-392-2811

Certificate of Analysis

Lab Work Order #: L2483810
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

Nellie Gudzak
Account Manager

ADDRESS: 190 Colonnade Road, Unit 7, Ottawa, ON K2E 7J5 Canada | Phone: +1 613 225 8279 | Fax: +1 613 225 2801
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L	Units	Extracted	Analyzed	Batch
L2483810-1 ALT-3 Sampled By: L. SINA on 29-JUL-20 @ 08:10 Matrix: WATER							
Physical Tests							
Conductivity	556		3.0	umhos/cm		07-AUG-20	R5176825
pH	7.47	PEHR	0.10	pH units		07-AUG-20	R5176825
Total Suspended Solids	58.3		3.0	mg/L	07-AUG-20	08-AUG-20	R5176673
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	207		10	mg/L		07-AUG-20	R5176825
Ammonia, Total (as N)	10.3	DLHC	0.50	mg/L		07-AUG-20	R5175442
Chloride (Cl)	40.9		0.50	mg/L		06-AUG-20	R5176294
Nitrate and Nitrite as N	<0.022		0.022	mg/L		07-AUG-20	
Nitrate (as N)	<0.020		0.020	mg/L		06-AUG-20	R5176294
Nitrite (as N)	<0.010		0.010	mg/L		06-AUG-20	R5176294
Sulfate (SO4)	8.13		0.30	mg/L		06-AUG-20	R5176294
Organic / Inorganic Carbon							
Total Organic Carbon	118	DLM	5.0	mg/L		11-AUG-20	R5179641
Bacteriological Tests							
Fecal Coliforms	800000	PEHR	100000	CFU/100mL		06-AUG-20	R5176168
Total Metals							
Aluminum (Al)-Total	0.385		0.0050	mg/L	05-AUG-20	07-AUG-20	R5175659
Antimony (Sb)-Total	0.00022		0.00010	mg/L	05-AUG-20	07-AUG-20	R5175659
Arsenic (As)-Total	0.00663		0.00010	mg/L	05-AUG-20	07-AUG-20	R5175659
Cadmium (Cd)-Total	0.0000355		0.0000050	mg/L	05-AUG-20	07-AUG-20	R5175659
Calcium (Ca)-Total	49.2		0.050	mg/L	05-AUG-20	07-AUG-20	R5175659
Chromium (Cr)-Total	0.00119		0.00050	mg/L	05-AUG-20	07-AUG-20	R5175659
Copper (Cu)-Total	0.0588		0.00050	mg/L	05-AUG-20	07-AUG-20	R5175659
Iron (Fe)-Total	2.34		0.010	mg/L	05-AUG-20	07-AUG-20	R5175659
Lead (Pb)-Total	1.80		0.050	ug/L	05-AUG-20	07-AUG-20	R5175659
Magnesium (Mg)-Total	10.8		0.0050	mg/L	05-AUG-20	07-AUG-20	R5175659
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		06-AUG-20	R5175355
Nickel (Ni)-Total	0.0203		0.00050	mg/L	05-AUG-20	07-AUG-20	R5175659
Potassium (K)-Total	7.89		0.050	mg/L	05-AUG-20	07-AUG-20	R5175659
Sodium (Na)-Total	33.5		0.050	mg/L	05-AUG-20	07-AUG-20	R5175659
Zinc (Zn)-Total	0.0128		0.0030	mg/L	05-AUG-20	07-AUG-20	R5175659
Aggregate Organics							
BOD	15	PEHR	10	mg/L		06-AUG-20	R5180197
Oil and Grease, Total	8.5		5.0	mg/L	06-AUG-20	06-AUG-20	R5175377
Phenols (4AAP)	7.3		1.0	ug/L		05-AUG-20	R5175495
L2483810-2 ALT-2 Sampled By: L. SINA on 29-JUL-20 @ 08:10 Matrix: WATER							
Physical Tests							
Conductivity	558		3.0	umhos/cm		07-AUG-20	R5176825
pH	7.45	PEHR	0.10	pH units		07-AUG-20	R5176825
Total Suspended Solids	57.5		3.0	mg/L	07-AUG-20	08-AUG-20	R5176673

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2483810-2 ALT-2 Sampled By: L. SINA on 29-JUL-20 @ 08:10 Matrix: WATER							
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	208		10	mg/L		07-AUG-20	R5176825
Ammonia, Total (as N)	10.1	DLHC	0.50	mg/L		07-AUG-20	R5175442
Chloride (Cl)	41.1		0.50	mg/L		06-AUG-20	R5176294
Nitrate and Nitrite as N	<0.022		0.022	mg/L		07-AUG-20	
Nitrate (as N)	<0.020		0.020	mg/L		06-AUG-20	R5176294
Nitrite (as N)	<0.010		0.010	mg/L		06-AUG-20	R5176294
Sulfate (SO4)	8.06		0.30	mg/L		06-AUG-20	R5176294
Organic / Inorganic Carbon							
Total Organic Carbon	126	DLM	5.0	mg/L		11-AUG-20	R5179641
Bacteriological Tests							
Fecal Coliforms	1000000	PEHR	100000	CFU/100mL		06-AUG-20	R5176168
Total Metals							
Aluminum (Al)-Total	0.389		0.0050	mg/L	05-AUG-20	07-AUG-20	R5175659
Antimony (Sb)-Total	0.00023		0.00010	mg/L	05-AUG-20	07-AUG-20	R5175659
Arsenic (As)-Total	0.00694		0.00010	mg/L	05-AUG-20	07-AUG-20	R5175659
Cadmium (Cd)-Total	0.0000334		0.0000050	mg/L	05-AUG-20	07-AUG-20	R5175659
Calcium (Ca)-Total	51.9		0.050	mg/L	05-AUG-20	07-AUG-20	R5175659
Chromium (Cr)-Total	0.00104		0.00050	mg/L	05-AUG-20	07-AUG-20	R5175659
Copper (Cu)-Total	0.0588		0.00050	mg/L	05-AUG-20	07-AUG-20	R5175659
Iron (Fe)-Total	2.34		0.010	mg/L	05-AUG-20	07-AUG-20	R5175659
Lead (Pb)-Total	1.85		0.050	ug/L	05-AUG-20	07-AUG-20	R5175659
Magnesium (Mg)-Total	11.1		0.0050	mg/L	05-AUG-20	07-AUG-20	R5175659
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		06-AUG-20	R5175355
Nickel (Ni)-Total	0.0209		0.00050	mg/L	05-AUG-20	07-AUG-20	R5175659
Potassium (K)-Total	8.22		0.050	mg/L	05-AUG-20	07-AUG-20	R5175659
Sodium (Na)-Total	34.9		0.050	mg/L	05-AUG-20	07-AUG-20	R5175659
Zinc (Zn)-Total	0.0123		0.0030	mg/L	05-AUG-20	07-AUG-20	R5175659
Aggregate Organics							
BOD	24	PEHR	10	mg/L		06-AUG-20	R5180197
Oil and Grease, Total	8.6		5.0	mg/L	06-AUG-20	06-AUG-20	R5175377
Phenols (4AAP)	3.3		1.0	ug/L		05-AUG-20	R5175495

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Total	MS-B	L2483810-1, -2
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2483810-1, -2
Matrix Spike	Sodium (Na)-Total	MS-B	L2483810-1, -2
Matrix Spike	Ammonia, Total (as N)	MS-B	L2483810-1, -2
Matrix Spike	Nitrite (as N)	MS-B	L2483810-1, -2
Matrix Spike	Nitrate (as N)	MS-B	L2483810-1, -2
Matrix Spike	Total Organic Carbon	MS-B	L2483810-1, -2

Sample Parameter Qualifier key listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-WT	Water	Alkalinity, Total (as CaCO3)	APHA 2320B

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint.

BOD-WT	Water	BOD	APHA 5210 B

This analysis is carried out using procedures adapted from APHA Method 5210B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT	Water	Conductivity	APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-N2N3-WT	Water	Calculate from NO2 + NO3	APHA 4110 B

FC-MF-WT	Water	Fecal Coliforms	SM 9222D

A 100mL volume of sample is filtered through a membrane, the membrane is placed on mFC agar and incubated at 24–2h@44.5–0.2℃. Method ID: WT-TM-1200

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

		Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

Reference Information

NH3-F-WT	Water		

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

OGG-TOT-WT	Water	Oil and Grease, Total	APHA 5520 B

The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.

PH-WT	Water	pH	APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1□C for a minimum of four hours or until a constant weight is achieved.

TOC-WT	Water	Total Organic Carbon	APHA 5310B

Sample is injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic cabon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Appendix F

List of Waste Disposal Activities
Year: 2020
Reference: 8AC-ALT1929

Monthly Waste Incineration at CFS Alert - 8AC-ALT1929					
Year *[yr]*	**Month** *[mo]*	**Incineraion Days per Month** *[day]*	**Solid waste Incinerated (Millionaire's Dump)** *[lbs]*	**Liquid Waste Incinerated** *[Liters]*	**Loose Waste Incinerated (Main Station Landfill)** *[lbs]*
2020	JAN	13	**2700**	2240	1600
2020	FEB	7	**2700**	672	3100
2020	MAR	7	**3200**	0	3550
2020	APR	6	**4800**	0	900
2020	MAY	5	**1800**	288	2200
2020	JUN	8	**2800**	448	3300
2020	JUL	12	**2700**	2672	2400
2020	AUG	7	**1600**	190	3900
2020	SEP	10	**0**	404	7100
2020	OCT	7	**5700**	125	600
2020	NOV	6	**3200**	648	800
2020	DEC	7	**3200**	359	1600
Annual Average [lbs/L/mo]:			**2867**	671	2588
Observed Minimum [Lbs/L/mo]:			0	0	600
Observed Maximum [Lbs/L/mo]:			***5700***	2672	7100

Main Station Landfill:
-Deposition of non-hazardous incinerator ash and all acceptable materials to site.

Millionaire's Dump:
-In 2018 the Millionaire's dump was closed to disposal of all station waste. No material was placed in the dump in 2020.

Battery Dump:
-No wastes were deposited at this site; no waste deposition is allowed at this site.

Dump #3:
-No wastes were deposited at this site; no waste deposition is allowed at this site.

Landfarms:

ALT-11 Landfarm
- ALT-11 (Airfield Land arm) is currently at capacity. No new material was added to this location in 2020.

ALT 12 (Day tank)
- Contaminated materials was deposited into ALT-11 landfarm in 2019; this material was treated and existing material was rotated to facilitate aeration.
The ALT 12 landfarm was taken temporarily out of commission in 2018 due to a punctured liner during the material transfer. All material was removed. Planed repairs to the liner are to take place during the summer of 2021.

Hazardous Waste Backhauled from CFS Alert in 2020:

As listed in Movement Document 2581626-5:
- 0.009 Kg of waste PCB's to 8 Wing Trenton.
- 20 L of Organic hazardous waste to 8 Wing Trenton

As listed in Movement Document 2581627-3:
- 2.26 Kg of Mercury containing waste to 8 Wing Trenton
- 1507 Kg of Waste batteries to 8 Wing Trenton

As listed in Movement Document 2581628-1:
- 184 L of waste gasoline to 8 Wing Trenton
- 12 L of waste Diesel to 8 Wing Trenton
- 204 L of waste phosphoric acid to 8 Wing Trenton
- 27 L of waste oil to 8 Wing Trenton

As listed in Movement Document 2581629-9:
- 160 L of waste gasoline to 8 Wing Trenton
- 6 L of waste Diesel to 8 Wing Trenton

As listed in Movement Document 2581631-5:
- 59 L of waste phosphoric acid to 8 Wing Trenton.

CFS Alert Hazardous Waste Generator #NUG100048;
DND Hazardous Waste Carrier #NUC200012.

All hazardous wastes from CFS Alert were collected at 8 Wing Trenton and transferred to contractors for proper disposal under 8 Wing Trenton's Ontario Hazardous Waste Generator #ON0046507.

MOVEMENT DOCUMENT / MANIFEST
DOCUMENT DE MOUVEMENT / MANIFESTE

2581626-5

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

Movement Document / Manifest Reference No. / N° de référence du document de mouvement/manifeste

A Generator / consignor — Producteur / expéditeur
Registration No. / Provincial ID No.: NUG 100048
Company name: CFS ALERT / DND
Mailing address: P.O. BOX 5210, BELLEVILLE, ON — Postal code: K8N 5W6
Tel. No.: ( )
Shipping site address: CFS ALERT SUPPLY
City: ALERT — Province: NU — Postal code: K8N 5W6
Intended Receiver / consignee — Registration No. / Provincial ID No.:
SHAWN LUCAS
Mailing address: 8 WING — City: TRENTON — Province: ON
Tel. No.: 613 392 2811 X 2896
Receiving site address: 8 WING TRENTON

B Carrier / Transporteur
Registration No. / Provincial ID No.: NUC 20012
Company name: DND 436 SQN
Mailing address: 8 WING — City: TRENTON — Province: ON — Postal code: K0K 3W0
Tel. No.: ( )
Vehicle / Trailer – Rail car No. 1 / Trailer – Rail car No. 2 — Registration No.: C130J 130609
Port of entry / Point d'entrée: international use only — Port of exit / Point de sortie: international use only
Carrier Certification: I certify that I have received waste or recyclable material from the generator / consignor for delivery to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct.
Name of authorized person (print): X M. CARLIE SCHACHER
Tel. No.:
Year: 2020 — Month: 09 — Day: 24 — Signature: [signature]

Prov code	Shipping name	Class / Sub class	UN No.	Packing group	Quantity shipped	Units L or Kg	Packaging No.	Packaging Code	Phys. state
NU	WASTE POLYCHLORINATED BIPHENYLS SOLID	9	3432	II	.009	KG	1	04	S
NU	WASTE TOXIC LIQUID, ORGANIC, N.O.S.	6.1	2810	III	20	L	1	07	L

Notice No.	Notice Line No.	Shipment	Of / De	D or R code	C code	Basel Annex VIII or OECD Code	H code	Y code	National code Export	National code Import	Customs code(s)
International use only											

Generator / consignor certification: I certify that the information contained in Part A is correct and complete. I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.
Attestation du producteur / expéditeur: J'atteste que tous les renseignements à la partie A sont exacts et complets. Je déclare que le contenu de ce chargement est décrit ci-dessus de façon complète et exacte par la désignation officielle de transport et qu'il est convenablement classé, emballé, marqué, étiqueté, muni de plaques-étiquettes et à tous égards bien conditionné pour être transporté conformément aux réglementations internationales et nationales applicables.

Name of authorized person (print): MCPL BOUCHER — Signature: [signature]
Tel. No.: 613 945 3145
Date shipped: Year 2020 — Month 09 — Day 24 — Time: 1100
Scheduled arrival date: Year 2020 — Month 09 — Day 25

C Receiver / consignee — Réceptionnaire / destinataire
Registration No. / Provincial ID No.:
Receiver / consignee information same as in Part A: ☐ Yes / Oui ☐ No, complete the box below
Company name / Mailing address / City / Province / Postal code / E-mail / Tel. No. ( ) / Receiving site address
Date received: Year / Month / Day — Time ☐ AM ☐ PM
If waste or recyclable material to be transferred, specify intended company name — Registration No. / Provincial ID No.

Quantity received	Units L or Kg	Comments	Handling Code	Shipment Accepted	Shipment Refused	Decont. Pack.	Decont. Veh.

If handling code "Other" (specify):
Receiver / consignee certification: I certify that the information contained in Part C is correct and complete.
Name of authorized person (print): — Signature: — Tel. No. ( )
Special handling / Manutention spéciale: ☐ Attached / Ci-joint ☐ As follows / Ci-contre

Instructions on reverse / Instructions au verso

Copy / Copie 1 (white / blanche)

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.

2581627-3

Movement Document / Manifest Reference No. / N° de référence du document de mouvement/manifeste

A — Generator / consignor / Producteur / expéditeur
Registration No. / Provincial ID No.: NUG 100048
Company name: CFS ALERT / DND
Mailing address: P.O. BOX 5210 BELLEVILLE ON — Postal code: K8N 5W6
Shipping site address: CFS ALERT, SUPPLY
City: ALERT — Province: NU — Postal code: K8N 5W6

Intended Receiver / consignee — Registration No.: 2
SHAWN LUCAS
Mailing address: 8 WING TRENTON ON — Postal code: K0K 3W0
E-mail: SHAWN.LUCAS@FORCES.GC.CA — Tel. No.: 613 392 2811 x 2896
Receiving site address: 8 WING TRENTON, ASTRA — ON — K0K 3W0

B — Carrier / Transporteur
Registration No. / Provincial ID No.: NUC 200012
Company name: DND 429 SQN
City: TRENTON — Province: ON — Postal code: K0K 3W0
Vehicle / Trailer No. 1: ~~G36-5 T30~~ — Trailer No. 2: CC177 702 — Prov: ON
Carrier certification: Name of authorized person: Derek Bristol — Tel. No.: 5105
Year/Month/Day: 2020 09 30 — Signature

Prov code	Shipping name	Class / Sub class(es)	UN No.	Packing group	Quantity shipped	Units	Packaging No.	Codes	Phys. state
NU	WASTE GASOLINE	3	1203	II	160	L	8	01	L
NU	WASTE DIESEL	3	1202	III	6	L	3	01	L

C — Receiver / consignee / Réceptionnaire / destinataire
(Receiver information same as in Part A: ☐ Yes/Oui ☐ No)

Notice No. | Notice Line No. | Shipment | Of/De | D or R code | C code | Basel Annex VIII or OECD Code | H code | Y code | National code: Export / Import | Customs code(s)

International use only

Generator / consignor certification: I certify that the information contained in Part A is correct and complete. I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Name of authorized person: M.A. BOUCHER — Tel. No.: 613 945 3452 — Signature
Date shipped: 2020 09 30 — Time: AM
Scheduled arrival date: 2020 09 30

Instructions on reverse / Instructions au verso

Copy / Copie 1 (white / blanche)

8AC-ALT1929-2020

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 fédérales et provinciales sur l'environnement et le transport.

2581628-1

Movement Document / Manifest Reference No.
N° de référence du document de mouvement/manifeste

A — Generator / consignor / Producteur / expéditeur

Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial: NUD 100048

Company name / Nom de l'entreprise: CFS ALERT / DND

Mailing address / Adresse postale: P.O. BOX 5210 BELLEVILLE, ON — Postal code / Code postal: K8N 5W6

Tel. No. / N° de tél.: ( )

Shipping site address / Adresse du lieu de l'expédition: CFS ALERT SUPPLY

City / Ville: ALERT — Province: NU — Postal code / Code postal: K8N 5W6

Intended Receiver / consignee / Réceptionnaire / destinataire prévu

Registration No. / Provincial ID No.:

Company name: SHAWN LUCAS

Mailing address / Adresse postale: 8 WING — City / Ville: TRENTON — Province: ON — Postal code / Code postal: K0K 3W0

E-mail / Courriel électronique: SHAWN.LUCAS@FORCES.GC.CA — Tel. No. / N° de tél.: 613 392-2811 x2896

Receiving site address / Adresse du lieu de destination: 8 WING TRENTON

City / Ville: ASTRA — Province: ON — Postal code / Code postal: K0K 3W0

B — Carrier / Transporteur

Registration No. / Provincial ID No.: NUC 200012

Company name / Nom de l'entreprise: DND 429 SQN

Mailing address / Adresse postale: TRENTON — Province: ON — Postal code / Code postal: K0K 3W0

E-mail / Courriel électronique:

Tel. No. / N° de tél.: ( )

Vehicle / Véhicule — Registration No. / N° d'immatriculation: CC177 701 — Prov: ON

Trailer - Rail car No. 1 / 1ʳᵉ remorque - wagon:

Trailer - Rail car No. 2 / 2ᵉ remorque - wagon:

Port of entry / Point d'entrée: international use only — Port of exit / Point de sortie: international use only

Carrier Certification: I certify that I have received waste or recyclable material from the generator / consignor for delivery to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct.
Attestation du transporteur: J'atteste avoir reçu les déchets ou matières recyclables du producteur / expéditeur en vue de leur livraison au réceptionnaire / destinataire, tels qu'ils figurent à la partie A et que les renseignements inscrits à la partie B sont exacts et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): MCPL HARKNESS

Tel. No. / N° de tél.: ( )

Year / Année: 2010 — Month / Mois: 08 — Day / Jour: — Signature: [signature]

Prev. code / Code préc.	Shipping name / Appellation réglementaire	Class / Classe, Sub. class(es)	UN No / NIP	Packing / Gr. d'emballage	Quantity shipped / Quantité expédiée	Units / Unités	Packaging No. / N°	Code	Phys. state / État phys.
NU	WASTE GASOLINE	3	1203	II	184	L	12	01	L
NU	WASTE DIESEL	3	1202	III	12	L	6	01	L
NU	WASTE PHOSPHORIC ACID, SOLUTION	8	1805	III	204	L	6	01	L
NU	WASTE OIL	/	/	/	27	L	1	01	L

Notice No / N° de notification	Notice Line No / N° de ligne de la notification	Shipment / Envoi	Of / De	D or R code / Code D ou R	C code / Code C	Basel Annex VIII or OECD Code / Annexe VIII de Bâle ou Code OCDE	H code / Code H	Y code / Code Y	Export / Exportation	Import / Importation	Customs code(s) / Code(s) de douanes

International use only

Generator / consignor certification: I certify that the information contained in Part A is correct and complete. I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.
Attestation du producteur / expéditeur: J'atteste que tous les renseignements à la partie A sont exacts et complets. Je déclare que le contenu de ce chargement est décrit ci-dessus de façon complète et exacte par la désignation officielle de transport et qu'il est convenablement classé, emballé, marqué, étiqueté, muni de plaques-étiquettes et à tous égards bien conditionné pour être transporté conformément aux réglementations internationales et nationales applicables.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): MCPL GALLANT

Tel. No. / N° de tél.: 613-945-3145 / 3294

Signature: [signature]

C — Receiver / consignee / Réceptionnaire / destinataire

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.:

Receiver / consignee information same as in Part A / Les renseignements du réceptionnaire / destinataire sont les mêmes qu'à la Partie A: ☐ Yes / Oui ☐ No, complete the box below / Non, remplir la case ci-dessous

Company name / Nom de l'entreprise:

Mailing address / Adresse postale:

City / Ville: — Province: — Postal code / Code postal:

E-mail / Courriel électronique: — Tel. No. / N° de tél.: ( )

Receiving site address / Adresse du lieu de destination:

Date received / Date de réception: Year / Année — Month / Mois — Day / Jour — Time / Heure ☐ AM ☐ PM

If waste or recyclable material to be transferred, specify intended company name / Si les déchets ou matières recyclables doivent être transférés, préciser le nom du destinataire — Registration No./Provincial ID No.:

Quantity received / Quantité reçue	Units / Unités	Comments / Commentaires	Handling Code / Code de manutention	Shipment / Envoi Accepted / Accepté	Refused / Refusé	Discrepancy Pack.	Vol.

If handling code "Other" (specify) / Si code de manutention « autre » (spécifier):

Receiver / consignee certification: I certify that the information contained in Part C is correct and complete. / Attestation du réceptionnaire / destinataire: J'atteste que tous les renseignements à la partie C sont exacts et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie):

Signature: — Tel. No. / N° de tél.: ( )

Special handling / Manutention spéciale: ☐ Attached / Ci-joint ☐ As follows / Ci-contre

Date shipped / Date d'expédition: Year / Année 2010 — Month / Mois 10 — Day / Jour 08 — Time / Heure 1800

Scheduled arrival date / Date d'arrivée prévue: Year / Année 2010 — Month / Mois 10 — Day / Jour 09

Instructions on reverse
Instructions au verso

Copy / Copie 1 (white / blanche)

8AC-ALT1929-2020

MOVEMENT DOCUMENT / MANIFEST
DOCUMENT DE MOUVEMENT / MANIFESTE

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

Movement Document / Manifest Reference No.
N° de référence du document de mouvement/manifeste

2581629-9

A Generator / consignor — Producteur / expéditeur

Registration No. / Provincial ID No.: NUG 600048

Company name / Nom de l'entreprise: CFS ALERT / DND

Mailing address / Adresse postale: P.O.BOX 5210, BELLEVILLE ON K8N 5W6

Shipping site address / Adresse du lieu de l'expédition: CFS ALERT SUPPLY

City / Ville: ALERT, NU — Postal code / Code postal: K8N 5W6

Intended Receiver / consignee — Réceptionnaire / destinataire prévu: SHAWN LUCAS

Mailing address / Adresse postale: 8WING TRENTON ON K0K 3W0

E-mail / Courriel électronique: SHAWN.LUCAS@FORCES.GC.CA — Tel. No. / N° de tél.: 613 392 2811 x 2896

Receiving site address / Adresse du lieu de destination: 8WING TRENTON

City / Ville: ASTRA — Province: ON — Postal code / Code postal: K0K 3W0

B Carrier — Transporteur

Registration No. / Provincial ID No.: NUC 200012

Company name / Nom de l'entreprise: DND 436 SQN

Mailing address / Adresse postale: TRENTON ON K0K 3W0

Vehicle / Véhicule: CC130J 608 — Prov: ON

Port of entry / Point d'entrée: International use only — Port of exit / Point de sortie: International use only

Carrier Certification: I certify that I have received waste or recyclable material from the generator / consignor for delivery to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct. / Attestation du transporteur : J'atteste avoir reçu les déchets ou matières recyclables du producteur / expéditeur en vue de leur livraison au réceptionnaire / destinataire, tels qu'ils figurent à la partie A et que les renseignements inscrits à la partie B sont exacts et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): MCPL BLANCHET

Year / Année: 20 — Month / Mois: 10 — Day / Jour: 21 — Signature: [signature]

Prov code / Code prov	Shipping name / Appellation réglementaire	Class / Classe	UN No. / N° NU	Packing / Gr d'emballage	Quantity shipped / Quantité expédiée	Units / Unités	Packaging No. / N°	Codes	Phys. state / État phys.
NU	WASTE BATTERIES, WET, FILLED WITH ACID	8	2794	II	1507	KG	3	07	S
NU	WASTE MERCURY CONTAINED IN MANUFACTURED ARTICLES	8(6.1)	3506	/	826	KG	4	01	S

Notice No. / N° de notification	Notice Line No. / N° de ligne de la notification	Shipment / Envoi	Of / De	D or R code / Code D ou R	C code / Code C	Basel Annex VIII or OECD Code / Annexe VIII de Bâle ou Code OCDE	H code / Code H	Y code / Code Y	Export / Exportation	Import / Importation	Customs code(s) / Code(s) de douanes
International use only											

Generator / consignor certification: I certify that the information contained in Part A is correct and complete. I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.
Attestation du producteur / expéditeur : J'atteste que tous les renseignements à la partie A sont exacts et complets. Je déclare que le contenu de ce chargement est décrit ci-dessus de façon complète et exacte par la désignation officielle de transport et qu'il est convenablement classé, emballé, marqué, étiqueté, muni de plaques-étiquettes et à tous égards bien conditionné pour être transporté conformément aux réglementations internationales et nationales applicables.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): MCPL BOUCHER — [signature]

Tel. No. / N° de tél.: 613 945 3145

Date shipped / Date d'expédition: Year / Année 20 — Month / Mois 10 — Day / Jour 21 — Time / Heure: 1800 AM/PM

Scheduled arrival date / Date d'arrivée prévue: Year / Année 20 — Month / Mois 10 — Day / Jour 22

C Receiver / consignee — Réceptionnaire / destinataire

Reference Nos. of other movement documents/manifest(s) used / N° de référence des autres documents de mouvement/manifestes utilisés

Registration No. / Provincial ID No.

Receiver / consignee information same as in Part A / Les renseignements du réceptionnaire / destinataire sont les mêmes qu'à la Partie A: ☐ Yes / Oui ☐ No, complete the box below / Non, remplir la case ci-dessous

Company name / Nom de l'entreprise

Mailing address / Adresse postale

City / Ville — Province — Postal code / Code postal

E-mail / Courriel électronique — Tel. No. / N° de tél.

Receiving site address / Adresse du lieu de destination

Date received / Date de réception: Year / Année — Month / Mois — Day / Jour — Time / Heure ☐ AM ☐ PM

If waste or recyclable material to be transferred, specify intended company name / Si les déchets ou matières recyclables doivent être transférés, préciser le nom du destinataire — Registration No. / Provincial ID No.

Quantity received / Quantité reçue	Units / Unités	Comments / Commentaires	Handling Code / Code de manutention	Shipment Accepted / Envoi Accepté	Refused / Refusé	Pack.	Veh.

If handling code "Other" (specify) / Si code de manutention « autre » (préciser)

Receiver / consignee certification: I certify that the information contained in Part C is correct and complete. / Attestation du réceptionnaire / destinataire : J'atteste que tous les renseignements à la partie C sont exacts et complets.

Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie)

Signature — Tel. No. / N° de tél.

Special handling / Manutention spéciale: ☐ Attached / Ci-joint ☐ As follows / Ci-contre

Instructions on reverse
Instructions au verso

Copy / Copie 1 (white / blanche)

8AC-ALT1929-2020

MOVEMENT DOCUMENT / MANIFEST
DOCUMENT DE MOUVEMENT / MANIFESTE

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

2581631-5

Movement Document / Manifest Reference No.
N° de référence du document de mouvement/manifeste

A Generator / consignor / Producteur / expéditeur — Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial: NVG 100048

Company name / Nom de l'entreprise: CFS Alert / DND
Mailing address / Adresse postale: PO Box 5210 — City / Ville: Belleville — Province: ONT — Postal code / Code postal: K8N 5W6
E-mail / Courier électronique — Tel. No. / N° de tél.:
Shipping site address / Adresse du lieu de l'expédition: CFS Alert / Supply
City / Ville: Alert — Province: NU — Postal code / Code postal: K8N 5W6

Intended Receiver / consignee / Réceptionnaire / destinataire prévu: Shawn Lucas — Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial:
Mailing address / Adresse postale: 8 Wing — City / Ville: Trenton — Province: ONT — Postal code / Code postal:
E-mail / Courier électronique — Tel. No. / N° de tél.: 613 392 2811 x2896
Receiving site address / Adresse du lieu de destination: 8 Wing Trenton
City / Ville — Province — Postal code / Code postal

B Carrier / Transporteur — Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial: NUC 200012

Company name / Nom de l'entreprise: DND 436 SQN
Mailing address / Adresse postale — City / Ville — Province — Postal code / Code postal
E-mail / Courier électronique — Tel. No. / N° de tél.:

Vehicle / Véhicule — Registration No. / N° d'immatriculation — Prov.
Trailer - Rail car No. 1 / 1re remorque - wagon: CC 1305 — 130 614
Trailer - Rail car No. 2 / 2e remorque - wagon:

Port of entry / Point d'entrée — Port of exit / Point de sortie

Carrier Certification: I certify that I have received waste or recyclable material from the generator / consignor for delivery to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct. / Attestation du transporteur : J'atteste avoir reçu les déchets ou matières recyclables du producteur / expéditeur en vue de leur livraison au réceptionnaire / destinataire, tels qu'ils figurent à la partie A et que les renseignements inscrits à la partie B sont exacts et complets.
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie): M. Mercier — Tel. No. / N° de tél.:
Year / Année: 20 — Month / Mois: 12 — Day / Jour: 15 — Signature

C Receiver / consignee / Réceptionnaire / destinataire — Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial:
Receiver / consignee information same as in Part A / Les renseignements du réceptionnaire / destinataire sont les mêmes qu'à la Partie A: ☐ Yes / Oui ☐ No, complete the box below / Non, remplir la case ci-dessous
Company name / Nom de l'entreprise
Mailing address / Adresse postale
City / Ville — Province — Postal code / Code postal
E-mail / Courier électronique — Tel. No. / N° de tél.:
Receiving site address / Adresse du lieu de destination
Date received / Date de réception: Year / Année — Month / Mois — Day / Jour — Time / Heure — ☐ A.M. ☐ P.M.
If waste or recyclable material to be transferred, specify intended company name / Si les déchets ou matières recyclables doivent être transférés, préciser le nom du destinataire — Registration No./Provincial ID No. / N° d'immatriculation/d'id provincial

Prov code / Code prov	Shipping name / Appellation réglementaire	Class / Classe — Sub class(es) / Classe(s) subs	UN No / N° NU	Packing / req. gr / Gr. d'emballage / de risque	Quantity shipped / Quantité expédiée	Units / L or / ou Kg / Unités	Packaging/Container No. / N°	Packaging/Container Codes / Int. – ext.	Phys. state / État phys.
NU	waste Phosphoric acid, Solution	8	1805	III	59	L	2	01	L

Quantity received / Quantité reçue	Units / L or / ou Kg / Unités	Comments / Commentaires	Handling Code / Code de manutention	Shipment / Envoi — Accepted / Accepté	Shipment / Envoi — Refused / Refusé	Decont. — Pack. Cont.	Decont. — Veh. / véh.

Notice No / N° de notification	Notice Line No / N° de ligne de la notification	Shipment Envoi	Of / De	D or R code / Code D ou R	C code / Code C	Basel Annex VII or OECD Code / Annexe VIII de Bâle ou Code OCDE	H code / Code H	Y code / Code Y	National code in country of / Code du pays — Export / Exportation	Import / Importation	Customs code(s) / Code(s) de douanes

International use only

If handling code "Other" (specify) / Si code de manutention « autre » (spécifier):

Receiver / consignee certification: I certify that the information contained in Part C is correct and complete. / **Attestation du réceptionnaire / destinataire :** J'atteste que tous les renseignements à la partie C sont exacts et complets.
Name of authorized person (print) / Nom de l'agent autorisé (caractères d'imprimerie):
Signature — Tel. No. / N° de tél.:

Special handling / Manutention spéciale: ☐ Attached / Ci-joint ☐ As follows / Ci-contre

Generator / consignor certification: I certify that the information contained in Part A is correct and complete. I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded and are in all respects in proper condition for transport according to applicable international and national governmental regulations.
Attestation du producteur / expéditeur : J'atteste que tous les renseignements à la partie A sont exacts et complets. Je déclare que le contenu de ce chargement est décrit ci-dessus de façon complète et exacte par la désignation officielle de transport et qu'il est convenablement classé, emballé, marqué, étiqueté, muni de plaques-étiquettes et à tous égards bien conditionné pour être transporté conformément aux réglementations internationales et nationales applicables.
Name of authorized person (print) / Nom de l'agent autorisé (caractère d'imprimerie): McPherson — Tel. No. / N° de tél.: 613 945 3145
Signature

Date shipped / Date d'expédition: Year / Année: 20 — Month / Mois: 12 — Day / Jour: 15 — Time / Heure: ☐ A.M. ☒ P.M. 1400
Scheduled arrival date / Date d'arrivée prévue: Year / Année: 20 — Month / Mois: 12 — Day / Jour: 16

Instructions on reverse
Instructions au verso

Copy / Copie 1 (white / blanche)

Appendix F

Progressive and Final Reclamation Work Undertaken
Year: 2020
Reference: 8AC-ALT1929, Part B, Item 1.

Progressive Reclamation Work Undertaken in 2020:

Due to COVID-19 world pandemic the Station was a minimal manning during the 2020 season. Limited to Emergency access only. As such no work was completed as previously scheduled.

Future works proposed for 2021:

A. Contaminated Sites In-Situ Bioremediation Work:
Continuation of the pilot scale in-situ bioremediation study for petroleum hydrocarbon biodegradation at the following sites:
1) Oxidator Building;
2) Baker's Dozen.
Soil samples will be collected for chemical and microbiological analyses including laboratory studies involving microcosm mineralization assays. Develop long term monitoring program for PHC contamination in key areas.

B. Reclaim of Soils in the Landfarm (ALT-11) Treatment Facility:
Regular monitoring of the downgrade area adjacent to the large biopile area will be performed to ensure no PHC contamination is moving from biopile area or from contaminated areas upgradient and to the west of the large biopile area.

Repairs to the north east corner of the berm will be repaired before the spring thaw. This was identified in the 2019 inspection conducted by the Territory.

C. Rotation of Soils in the Landfarm (ALT-11) Treatment Facilities:
Continuation of the microbial nutrient augmentation and aeration process to increase oxygen content in the contaminated soil to promote microbial and bacterial activity within the landfarm facilities. This will be conducted at the ALT-11 Landfarms.

ALT-12 treatment facility is currently closed awaiting liner repairs due to 2018 liner breach. All material has been removed for this location and transferred to the ALT-11 location. We are expecting that repairs will be completed this season 2021.

D. In-Situ Bio-Containment Pilot Research Study:
As indicated with the INAC Inspectors during the 2015 & 2017 Inspections, DND is taking a proactive approach, developing novel bio-containment barriers, to treat runoff and subsurface waters generated and passing through the boundaries of Federal Contaminated Sites. This activity will be conducted, and the effectiveness assessed, through a pilot research project with the National Research Council of Canada. The general purpose of these bio-containment barriers

is to develop a microbial technology solution for bioremediation of runoff and subsurface waters that pass through and/or are generated from contaminated sites prior to reaching the Arctic Ocean. This work has applicability for the entire Canadian Arctic environment.

E. Environmental Sampling for Per/Polyfluorocarbon (PFC) Delineation
Further conduct environmental sampling and screening for PFCs as well as to evaluate the potential of biodegradation of PFC as a remediation approach.

F. Phase 2 Environmental Site Assessment (ESA)/ Detailed Risk Assessment
DND has procured a firm to conduct a Phase 2 ESA/ detailed risk assessment to be conducted on the entire station for 2021 limited to contracting and COVID restrictions.

Appendix H

Proposed/ future Infrastructure Works
Year: 2020
Reference: 8AC-ALT1929 Schedule B item l.

Infrastructure Work Undertaken in 2020:

Due to COVID-19 world pandemic the Station was a minimal manning during the 2020 season. Limited to Emergency access only. As such no work was completed as previously scheduled.

Future works proposed for 2021:

A. Sewage Discharge Flow Monitoring:
Installation of a flow monitor on the discharge point of ALT-2 will be installed in the summer of 2021 as was previously planned for 2020 but delayed due to COVID. Results will be published in the 2021 Annual report or when requested.

A. ALT-12 Landfarm Liner Repair:
ALT-12 treatment facility is currently closed awaiting liner repairs due to 2018 liner breach. All material has been removed for this location and transferred to the ALT-11 location. We are expecting that repairs will be completed this season 2021.