

CEPOA-PM-P (200-1c)

19 October 1999

MEMORANDUM FOR Commander, U.S. Army Center For Health Promotions
and Preventive Medicine, ATTN: MCHB-TS-E
(Mr. T. Michael White), Building E-1675,
Aberdeen Proving Ground, Maryland 21010-5403

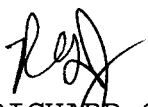
SUBJECT: Contract No. DACA85-98-D-0011, Delivery Order No. 5,
Memorandum, Results of Fish Tissue Analyses, Northeast Cape, St.
Lawrence Island, Alaska, 13 October 1999


1. Enclosed is a copy of a transmittal letter to the Agency for
Toxic Substance and Disease Registry (ATSDR) and the subject
laboratory data.

2. Please contact me at (907) 753-5606 if you have any
questions.

FOR THE COMMANDER:

2 Encls

 19 OCT 99
RICHARD G. JACKSON
Project Manager

Jackson/CEPOA-PM-P/5606/ljd 

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REPLY TO
ATTENTION OF:

CEPOA-PM-P (200-1c)

19 October 1999

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 898
ANCHORAGE, ALASKA 99506-0898

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FOR THE COMMANDER:

A handwritten signature in black ink, appearing to read "Richard G. Jackson", written over a horizontal line.

RICHARD G. JACKSON
Project Manager

2 Encls



REPLY TO
ATTENTION OF:

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
P.O. BOX 898
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October 19, 1999

Programs and Project Management
Formerly Used Defense Sites

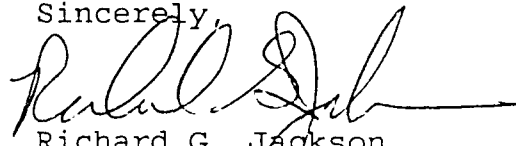
Dr. Susan Moore
Agency for Toxic Substance and Disease Registry
1600 Clifton Road, Mail Stop E32
Atlanta, Georgia 30333

Dear Dr. Moore:

Enclosed is a memorandum submitted to the Alaska District from our contractor, Montgomery Watson, concerning fish tissue sampling results from two streams in the vicinity of the Northeast Cape Formerly Used Defense Site on Saint Lawrence Island, Alaska. Fieldwork was performed during July 31, 1999 to August 3, 1999, and sample results have recently become available. We are forwarding these laboratory results now; however, a detailed report concerning this year's overall field activity will also be submitted within the next few weeks.

Please contact me at (907) 753-5606 if you have any questions.

Sincerely,



Richard G. Jackson
Project Manager

Enclosure

Copies Furnished:

Mr. Jeff Brownlee, Alaska Department of Environmental
Conservation, 555 Cordova Street, Anchorage, Alaska 99501
Mr. Richard W. Robinson, Agency for Toxic Substance and Disease
Registry, 1200 6th Avenue, Suite 1930, Seattle, Washington 98101

MEMORANDUM

To: Gary Busse, Montgomery Watson
From: Lisa Houston, Environment and Natural Resources Institute
Date: 10/13/99
Re: Results of fish tissue analyses, Northeast Cape, St. Lawrence Island

To assess the availability of toxic compounds and PCB's to higher trophic levels, fish tissue samples were collected by ENRI and analyzed for the polychlorinated biphenyls (PCBs) and polynuclear hydrocarbons (PAHs) listed in Table 1. The tissues were analyzed for PAHs, rather than diesel range organics, because naturally occurring lipids may interfere with petroleum/ diesel analyses.

The ecological assessment of the Suqitughneq River at Northeast Cape, St. Lawrence Island, Alaska was conducted July 31-August 3, 1999. Whole-fish, composite samples were collected for each fish species at five sampling sites. Site designations and descriptions are provided below.

- 99NEBK: reference sites located in a 200-meter reach of the Quangeghsaq River immediately upstream of the highest storm tide.
- 99NE00: upstream control located on Suqitughneq River upstream of the spill, approximately 100-meters upstream of the Access Road culvert bridge to approximately 200-meters downstream of the culvert bridge.
- 99NE01: potentially impacted site located on Suqitughneq River approximately 100-meters below the Access road bridge near the runway to approximately 200-meters above the bridge.
- 99NE02: upstream control located on a 100-meter reach in the headwaters of an unnamed tributary entering the Suqitughneq River downstream of the receptor creek.
- 99NERC: potentially impacted site located on a 200-meter reach of the receptor creek.

Results of fish tissue analyses are presented in Table 2. Five of the eighteen PAHs analyzed were present in tissue samples collected from blackfish at the receptor creek (99NERC). These compounds were not detected in tissue samples from any other site (Table 2). One PCB, Aroclor 1260, was present in Dolly Varden tissue samples collected on Suqitughneq River above and below the spill area (99NE00 and 99NE01) and in blackfish from the receptor creek, (99NERC).

Currently, Alaska has not established a statewide fish tissue monitoring program or fish consumption advisory guidelines. Table 3 shows the recommended monthly fish

consumption limits for PCBs for fish consumers based on the U.S. Environmental Protection Agency's values for risk assessment parameters (EPA-823-F-99-019, September 1999). Based on these guidelines, concentrations of PCBs in Dolly Varden and blackfish throughout the Suqitughneq River basin were within the "No consumption recommended" risk category. The US EPA's consumption limits are calculated as the number of allowable fish meals per month, based on the ranges of PCBs in the consumed fish tissue (fillets). The concentrations detected in samples collected at Northeast Cape are based on whole-fish, composite samples and therefore may not be directly comparable to the USEPA's consumption limits. Because PCBs are lipophilic and tend to collect in fatty tissues (belly flap, subcutaneous and dorsal fat, internal organs, gills, eye, and brain), concentrations detected at Northeast Cape represent the maximum levels of PCBs and PAHs consumed in whole fish. Actual exposure and risk to humans consuming these fish could depend on how fish are prepared for consumption (i.e., eaten raw or cooked, parts consumed, etc.).

The life history of some Dolly Varden also raises some concern for contamination of fish captured outside of the Suqitughneq River basin. Although no PCBs were detected in Dolly Varden from the Quangeghsaq River, this species is not characterized by stream fidelity and fish from the Suqitughneq drainage could be found in other area streams. ENRI recommends that fish from other nearby waterbodies be tested.

At the request of the U.S. Corps of Engineers, the Agency of Toxic Substances and Disease Registry (ATSDR) has been providing expertise to answer health issues raised by the Alaska Native Board Health concerning the Northeast Cape, St. Lawrence Island site. The fish tissue analyses conducted during the 1999 Tier II Ecological Assessment may assist them in completing a site-specific health assessment. Therefore, ENRI recommends that these results be forwarded to the ATSDR.

Please feel free to contact me at 257-2744 or Elaine Major at 257-2731 if you have any questions concerning these results.

Table 1. Composited, species-specific fish tissue samples were analyzed for each of the polynuclear aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) listed below. Sample preparation and analysis methods and detection limits are also provided.

| Parameter | Sample Preparation Method | Analysis Method | Units | Detection Limit (ppb) |
|--|---------------------------|-----------------|-------|-----------------------|
| Polynuclear aromatic hydrocarbons (PAHs) | | | | |
| 2-Methylnaphthalene | EPA 3540 | SIM | ppb | 5 |
| Acenaphthene | EPA 3540 | SIM | ppb | 5 |
| Acenaphthylene | EPA 3540 | SIM | ppb | 5 |
| Anthracene | EPA 3540 | SIM | ppb | 5 |
| Benz(a)anthracene | EPA 3540 | SIM | ppb | 5 |
| Benzo(a)pyrene | EPA 3540 | SIM | ppb | 5 |
| Benzo(b)fluoranthene | EPA 3540 | SIM | ppb | 5 |
| Benzo(g,h,i)perylene | EPA 3540 | SIM | ppb | 5 |
| Benzo(k)fluoranthene | EPA 3540 | SIM | ppb | 5 |
| Chrysene | EPA 3540 | SIM | ppb | 5 |
| Dibenz(a,h)anthracene | EPA 3540 | SIM | ppb | 5 |
| Dibenzofuran | EPA 3540 | SIM | ppb | 5 |
| Fluoranthene | EPA 3540 | SIM | ppb | 5 |
| Fluorene | EPA 3540 | SIM | ppb | 5 |
| Indeno(1,2,3-cd)pyrene | EPA 3540 | SIM | ppb | 5 |
| Naphthalene | EPA 3540 | SIM | ppb | 5 |
| Phenanthrene | EPA 3540 | SIM | ppb | 5 |
| Pyrene | EPA 3540 | SIM | ppb | 5 |
| Polychlorinated biphenyls (PCB's) | | | | |
| Aroclor 1016 | EPA 3540C | EPA 8082 | ppb | 50 |
| Aroclor 1221 | EPA 3540C | EPA 8082 | ppb | 50 |
| Aroclor 1232 | EPA 3540C | EPA 8082 | ppb | 50 |
| Aroclor 1242 | EPA 3540C | EPA 8082 | ppb | 50 |
| Aroclor 1248 | EPA 3540C | EPA 8082 | ppb | 50 |
| Aroclor 1254 | EPA 3540C | EPA 8082 | ppb | 50 |
| Aroclor 1260 | EPA 3540C | EPA 8082 | ppb | 50 |

Table 2. Concentrations of polynuclear aromatic carbons (PAHs) and polychlorinated biphenyls (PCBs) detected in fish tissue samples collected at each of the sampling sites^a.

| Parameters | Station designations, fish species codes ^b , and fish tissue concentrations (ppb) | | | | | | | |
|-------------------------------------|--|-----|--------|-----|--------|--------|----|--------|
| | 99NEBK | | 99NE01 | | 99NE00 | 99NE02 | | 99NERC |
| | DV | SB9 | SB9 | DV | DV | BF | DV | BF |
| Polynuclear Aromatic Carbons (PAHs) | | | | | | | | |
| 2-Methylnaphthalene | | | | | | | | 71 |
| Acenaphthene | | | | | | | | 7 |
| Fluorene | | | | | | | | 11 |
| Naphthalene | | | | | | | | 16 |
| Phenanthrene | | | | | | | | 9 |
| Polychlorinated Biphenyls (PCBs) | | | | | | | | |
| Aroclor 1260 | | | | 140 | 160 | | | 100 |

^a Concentrations based on whole-fish, composite samples.

^b Fish species codes

| | |
|-----|------------------------|
| SB9 | Nine spine stickleback |
| DV | Dolly Varden |
| BF | Blackfish |

Table 3. Monthly fish consumption limits for PCBs published by the USEPA (1999)^a.

| Risk-Based Consumption Limit | Noncancer Health Endpoints | Cancer Health Endpoints |
|------------------------------|--|--|
| Fish Meals/Month | Fish Tissue Concentrations (ppb, wet weight) | Fish Tissue Concentrations (ppb, wet weight) |
| 16 | >6-12 | >1.5-3 |
| 12 | >12-16 | >3-4 |
| 8 | >16-24 | >4-6 |
| 4 | >24-48 | >6-12 |
| 3 | >48-64 | >12-16 |
| 2 | >64-97 | >16-24 |
| 1 | >97-190 | >24-48 |
| <0.5 | >190-390 | >48-97 |
| None (<0.5) ^b | >390 | >97 |

^a Concentrations based on 8-ounce fillet USEPA-823-F-99-019, September 1999

^b None = No consumption recommended