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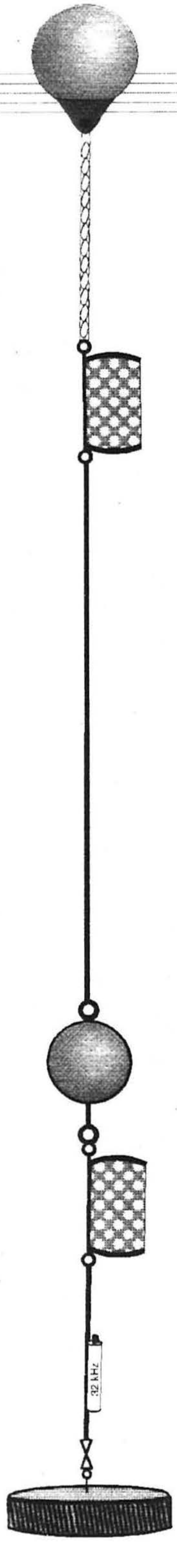
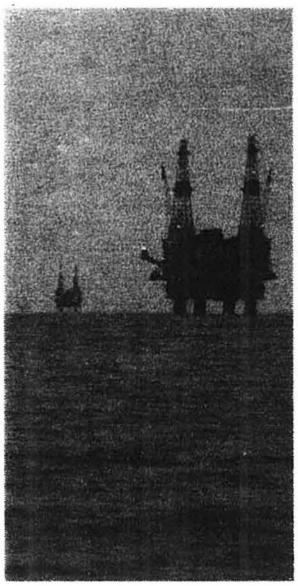
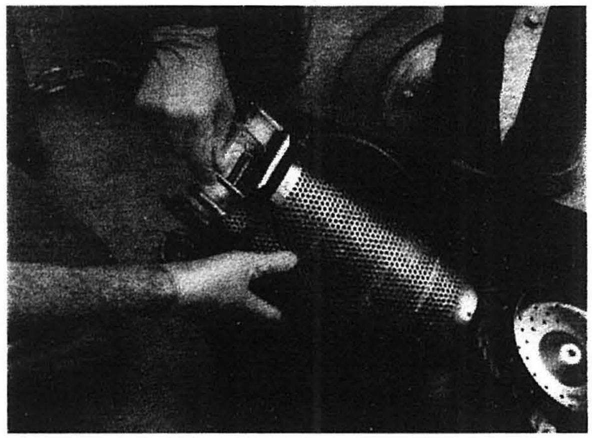
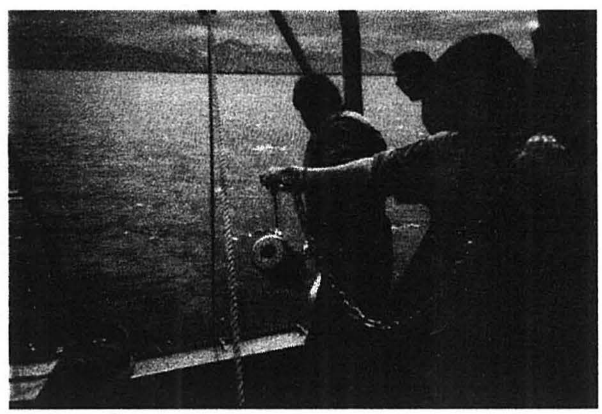
# FINAL REPORT - 1995

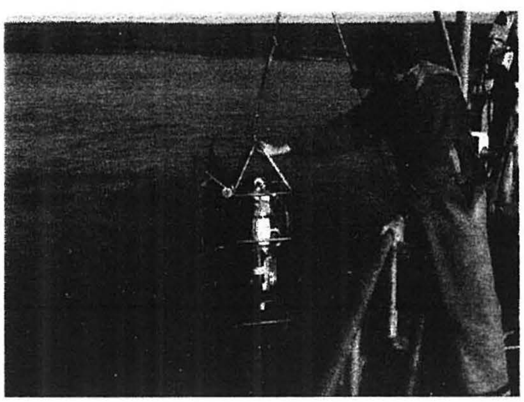
## COOK INLET ENVIRONMENTAL MONITORING PROGRAM











Prepared for:

COOK INLET
RCAC

Prepared by:

KINNETIC
LABORATORIES
INCORPORATED

**January 1996**

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# FINAL REPORT - 1995

# COOK INLET ENVIRONMENTAL MONITORING PROGRAM



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Cover: Sampling Photos from the 1995 EMP
Upper Left: Cook Inlet Rig (©1995 KLI)
Upper Right: SPMD (©1995 CIRCAC)
Lower Left: CTD Cast (©1995 Sean Reid)
Lower Right: Mooring Deployment (©1995 CIRCAC)

JANUARY 1996

## PRÉCIS

The Cook Inlet Regional Citizens Advisory Council's (CIRCAC) mission statement is to ensure the safe operation of the of the oil terminals, tankers, and facilities in Cook Inlet so that environmental impacts associated with the oil industry are minimized. To evaluate that the environmental impact portions of this statement are fulfilled, the Environmental Monitoring Committee (EMC) within CIRCAC has been conducting annual environmental monitoring. The Cook Inlet 1995 Environmental Monitoring Program (EMP) encompasses all of this monitoring for 1995 and is the continuation of a pilot program conducted during 1993 and 1994 with some minor modifications.

The 1995 EMP design focused on the chemical analysis of hydrocarbons in the sediment and water of Cook Inlet to help determine what the effects of those hydrocarbons might be on the fish and other animals in the region. Hydrocarbons were analyzed in subtidal sediments collected from the sea floor using a bottom grab. This provided information about what levels of hydrocarbons bottom-dwelling fish or shellfish might encounter in the sediments themselves. To help determine what levels of hydrocarbons might exist in the water, man-made sampling devices were used. These devices, called semi-permeable polymeric membrane devices (SPMDs), were designed to imitate animals by concentrating the available hydrocarbons from the water, just as a mussel or clam might do when the water they live in contains hydrocarbons. The SPMDs were suspended in the water on moorings for about a month to allow the hydrocarbons to accumulate in the samplers before testing. In addition, the 1995 program included testing Pacific halibut to help determine if they were being exposed to hydrocarbons. This testing involved looking at specific compounds in the gall bladders of the fish and performing a separate test of the fish livers. The 1995 program also included toxicity testing to determine if the Cook Inlet sediments were potentially toxic to animals, with a type of bacteria used as the test animal.

Additional measurements collected during the program included looking at the grain size and organic carbon content of the sediments so that these data could be used when interpreting the hydrocarbon results. Temperature, salinity, and other standard water quality measurements were also collected. Once the data were collected, statistical testing was used to look at differences between the stations to see if they were significant or not. In addition, the hydrocarbon "fingerprints" from the sediment and SPMD samples were used to help determine what the source of the petroleum hydrocarbons might be. Different sources in the study area might include, for example, Cook Inlet crude oil from oil platforms or tanker operations, fuel from boats or ships, hydrocarbons from forest fires, or natural seeps of oil from the sea floor.

Sampling took place at six sites in Cook Inlet, some of which were also sampled during the pilot program in 1993 and/or 1994. The sites were chosen by CIRCAC to look at oil industry activities (potential impact sites) as well as areas away from these activities (reference sites). The 1995 field program consisted of two surveys, the first of which included sediment sampling using a grab, preliminary fish trawling, and deployment of SPMD moorings. The second survey involved recovery of SPMD moorings and collection of fish samples using long-lining and other fishing methods.

In general, results from the 1995 program indicate that low levels of hydrocarbons exist in sediments and animals at the study sites. Although some differences between stations were found to exist for some of the items studied, no clear trend between sites was evident. Hydrocarbon concentrations in sediments from all 1995 program stations are considerably lower than the amount expected to cause adverse effects in animals. Fingerprints of sediment hydrocarbon results indicate a number of possible sources, with no one clear source identified. The sediments tested did not demonstrate any toxicity. In addition, the halibut from the two study sites that were tested showed low levels of exposure to hydrocarbons (similar to other areas considered uncontaminated), which was supported by the sediment results showing low hydrocarbon levels.

Interpretation of the SPMD results was made difficult by the fact that these types of samplers are relatively new and are still undergoing development. Hydrocarbon levels in SPMDs were higher in 1995 as compared to 1994 data, but most likely this means that the SPMD techniques are improving rather than the fact that Cook Inlet water contains more hydrocarbons now than it did before. However, more hydrocarbons were present in the SPMDs at the Trading Bay site than the other two sites tested, and this is in agreement with 1994 program results.

Continued monitoring of the study area will allow the collection of a baseline data set that could be used to help identify any future impacts of oil industry activities, including inputs that take place over many years as well as more acute inputs that could take place in a short time period, such as an oil spill. Collection of these data will help fulfill CIRCAC's mission of minimizing oil industries' potential environmental impacts to Cook Inlet.

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## EXECUTIVE SUMMARY


The Cook Inlet 1995 Environmental Monitoring Program (EMP) was designed to evaluate environmental trends associated with hydrocarbon inputs over time in Cook Inlet. The purpose of the monitoring program was to collect environmental data that could be used to: monitor for hydrocarbon accumulation in Cook Inlet; monitor for impacts of crude oil production and transportation in Cook Inlet; and establish baseline values for selected environmental variables that can be used in future studies. The EMP is administered under the auspices of the Environmental Monitoring Committee (EMC) within the Cook Inlet Regional Citizens Advisory Council (CIRCAC). This program is a continuation of a pilot program and was designed to provide continuity while employing a more comprehensive biological component.

The 1995 EMP design included providing synoptic measurements of sediment chemistry, toxicity, and bioaccumulation in resident organisms (fish). The program also included the use of passive sampling devices, semi-permeable polymeric membrane devices (SPMDs), to help assess the bioavailablity of hydrocarbons in the water column. In addition, standard hydrographic measurements were collected. The program data were used to address the following null hypothesis:

$H_0$: No significant differences can be detected in biological, chemical, or physical parameters among monitoring sites.

Sampling occurred at five sites throughout Cook Inlet, some of which were also sampled during the pilot program. The 1995 field program consisted of two surveys, the first of which included sediment sampling using a grab, preliminary fish trawling, and deployment of SPMD moorings. The second survey involved recovery of SPMD moorings and collection of fish samples using long-lining and other fishing methods. Standard hydrographic measurements were collected *in-situ* during both surveys.

Hydrocarbon parameters (polycyclic aromatic hydrocarbons [PAH]and total hydrocarbons) were determined in sediments and SPMDs using gas chromatograph/mass spectrometry (GC/MS) methods. Particle grain size and total organic carbon content of sediments were also analyzed. Toxicity of sediments was determined using Microtox® bioassay methods. Hydrocarbon exposure in fish was determined through the analyses of biological markers, including PAH metabolites in fish bile and cytochrome P4501A induction in liver tissue.

In general, data from the 1995 EMP indicate that low levels of hydrocarbons exist in sediments and biota at the study sites. Differences between stations were found to exist for some parameters, particularly for total PAH in sediment at the Null Zone site. This may indicate a slight accumulation of hydrocarbons at this site and could warrant further study. Total PAH values in sediments from all 1995 EMP stations are considerably lower than the Effects Range-Low level associated with adverse biological effects as defined by Long and Morgan (1990). Fingerprints of sediment PAH results indicate a probable combination of petrogenic (fossil fuels) and pyrogenic (combustion sources) hydrocarbons, with petrogenic compounds being in higher abundance. No sediment toxicity was demonstrated at any of the 1995 EMP sites. In addition, low levels of exposure to hydrocarbons were seen in Pacific halibut at the two study sites where exposure was assessed; bile metabolites and liver P4501A induction data compared favorably with control site results from recent studies performed in Puget Sound (Collier et al., 1995) and Antarctica (McDonald et al., 1995).

Use of SPMDs as bio-surrogates to help assess the bioavailability of hydrocarbons in the water column again met with limited success and showed potential methodology problems. Hydrocarbons levels in SPMDs from TRADB were elevated compared to other sites. Increased hydrocarbon concentrations seen in 1995 data as compared to 1994 most likely reflect changes in SPMD technology as opposed to increases in ambient water concentrations. Hydrographic profiling performed during the 1995 EMP indicated that, in general, the waters of Cook Inlet are well-mixed. Observed differences in hydrographic parameters between stations can be attributed to the geographic location within this large body of water.

Continued monitoring of sediment chemistry and bioaccumulation parameters will allow the compiling of baseline data which can be used to identify future impacts in the study area, including both chronic long-term inputs and more acute inputs such as oil releases. The SPMD technology is still developing and studies such as this, in conjunction with laboratory studies, will potentially lead to more regular use of SPMDs for applied monitoring programs.

# 1.0 INTRODUCTION

The Cook Inlet Regional Citizens Advisory Council (CIRCAC) was incorporated in 1990 to fulfill the mandates of the Oil Pollution Act of 1990 (OPA 90). This legislation, enacted in response to the 1989 T/V *Exxon Valdez* oil spill, called for the establishment of two demonstration programs designed to involve citizens in oversight of oil industry activities in Cook Inlet and Prince William Sound, Alaska. The legislation outlines the responsibilities of these groups, including the monitoring of environmental impacts of the operation of terminal facilities and crude oil tankers. To this end, the Environmental Monitoring Committee (EMC) was developed within the CIRCAC with an overall goal of monitoring and minimizing the environmental impacts associated with the oil industry.

This report documents the Cook Inlet 1995 Environmental Monitoring Program (EMP) performed for the CIRCAC by Kinnetic Laboratories, Inc. (KLI) of Anchorage, Alaska, in association with Texas A & M University's Geochemical and Environmental Research Group (GERG). This program is a continuation of monitoring performed since 1993 in Cook Inlet for the CIRCAC. The 1993 and 1994 programs, considered part of a pilot program, were designed to provide baseline information and early indication of potential environmental impacts. The 1995 program was designed to provide continuity with the pilot program while employing a more comprehensive biological component to enhance the search for potential oil industry impacts in Cook Inlet.

## 1.1 Program Objectives

The purpose of the monitoring program was to collect environmental data that can be used to:

- Monitor for hydrocarbon accumulation in Cook Inlet
- Monitor for impacts of crude oil production and transportation in Cook Inlet
- Establish baseline values for selected environmental variables that can be used in future studies.

The study was designed as a follow-on program to the pilot study. The pilot program involved the use of a "Sediment Quality Triad" approach that coupled sediment quality, including sediment chemistry and toxicity, with the biological condition of resident organisms (clams), including bioaccumulation of contaminants in those organisms. The pilot program also included the use of passive sampling devices, semi-permeable polymeric membrane devices (SPMDs), that help assess the bioavailablity of contaminants in the water column. The 1995 program incorporated several of these components, although the approach was somewhat different. The 1993 pilot program also included the use of transplanted mussels, but this portion of the program was unsuccessful and has been discontinued.

The 1995 program continued the design of providing synoptic measurements of sediment chemistry, toxicity, and bioaccumulation in resident organisms (using fish rather than clams and mussels to look at the latter component). Toxicity analyses included the use of a tiered approach, in which Microtox® testing results from the first survey were used to determine whether additional chemical and toxicological testing of sediments was required during the second survey. The sampling and statistical approach was appropriate to test the following null hypothesis:

$H_0$: No significant differences can be detected in biological, chemical, or physical parameters among monitoring sites.

## 1.2 Study Design

The 1995 field program consisted of two surveys and corresponded to the pilot program schedule with cruises in both June and July (Arthur D. Little [ADL], 1995a; 1995b). The first survey included sediment sampling, preliminary fish trawling, and deployment of SPMD moorings. The second survey involved recovery of SPMD moorings and collection of fish samples using long-lining and other fishing methods.

During the first survey, sediments were collected for toxicity testing using Microtox® (Tier 1). Results from these tests were used to determine whether additional toxicity testing in the form of bivalve larvae bioassays would be performed (Tier 2). The second survey was scheduled to include Tier 2 sediment sampling if warranted by the toxicity results from the first survey; this was not performed due to the low toxicity exhibited by survey one samples.

Sampling was completed at the six sites provided in Table 1. These include the pre-existing stations of Trading Bay, East Forelands, and Kamishak Bay, along with newly-established stations in Kachemak Bay near the tanker anchorage, in the Null Zone, and in southeastern Kamishak Bay (Figure 1). The Null Zone was included because it had been identified in earlier circulation studies as a region where little or no net circulation exists (i.e., when tidal currents were vector averaged, the net or residual circulation was very low [Burbank 1977]). This low net circulation identified this site as a potential depositional area for suspended sediments being swept down the Inlet. At each of the study sites, a variety of samples was collected.

Analytical strategy for the program is provided in Table 2, and analytical methods are described in Section 2.2. Hydrocarbon parameters were determined in sediments and SPMDs using state-of-the-art gas chromatograph/mass spectrometry (GC/MS) methods. Concomitant parameters of total organic carbon (TOC) and particle grain size (PGS) were determined using standardized techniques. Although body burdens of polynuclear aromatic hydrocarbons (PAH) were no longer analyzed in the bivalve *Macoma* spp. as part of the 1995 program, the Bivalve Condition Index was recorded.

In contrast to the pilot program, different bioassay techniques and two types of biological markers were used to provide further information on potential oil-industry effects on biota in the study area. The following provides a short discussion on each of the 1995 program components, with emphasis on those components that were new to the program this year.

### 1.2.1 Sediment Testing

The determination of PAH, total hydrocarbons (THC), and toxicity of sediments was used in this program to provide information concerning the potential accumulation of hydrocarbons in the marine environment. The analysis of PAH is useful for determining levels of hydrocarbon contamination, the likely sources of contamination, and the relative contribution of petrogenic, pyrogenic, or other sources (biogenic or diagenic). In addition, THC was analyzed as an indicator of hydrocarbon inputs to the system, although this measure is not useful in source identification. Each of these hydrocarbon parameters was used in the pilot program and have been extensively used on other environmental programs of this type. In addition, the concomitant parameters of PGS and TOC were determined in sediments. These parameters have been shown to correlate with hydrocarbon levels and are often used to standardize organics such as PAH and THC prior to hypothesis testing.

Toxicity testing was employed to help assess potential effects on the biota of petroleum hydrocarbon accumulation in marine sediments. For the 1995 program, a Microtox® bioassay (Beckman Instruments, 1982; Long and Markel, 1992) was used. This is a sensitive toxicity testing method based on emission of light by bacteria. This type of bioassay is advantageous in that it is rapid, is less expensive than other bioassay tests, and can be used with various types of sediments regardless of particle grain size or salinity of interstitial water contained in the sediments. This was a consideration because results of the pilot program's solid-phase toxicity test using the amphipod *Ampelisca abdita* performed in 1993 and 1994 showed elevated levels of toxicity that were not correlated to petroleum contamination in the sediments. Without multiple toxicity tests, Arthur D. Little was not able to arrive at any conclusions on the cause of this toxicity or to rule out sediment grain size as the causal factor (ADL, 1995a; 1995b).

To aid in the interpretation of the toxicity results and the overall assessment effort, a two-tiered approach to toxicity assessment was used during the 1995 program, as described in Section 1.2. In addition to the Microtox® bioassays, a suspended phase bivalve larvae bioassay was scheduled to be performed on sediments from stations showing toxicity. as previously mentioned, the advantage of the suspended-phase test over the solid-phase amphipod test is that fine-grained sediments could be ruled out as a possible factor influencing mortality. This testing would have utilized the blue mussel, *Mytilus edulis*. This species was selected because it is indigenous to parts of Cook Inlet, is commonly used in this type of testing, and a large body of literature exists for this specific species in terms of toxicity.

Table 1. Sampling and Station Location Information for the CIRCAC 1995 EMP.

| Sampling Location | Station Designation | Type of Samples Collected | Survey | Replicate | Latitude (N) | Longitude (W) | Depth* (m) |
|---|---|---|---|---|---|---|---|
| East Forelands | EFORE-H | Hydrographic | 1 | N/A | 60° 45' 36.7" | 151° 17' 05.4" | 7.5 |
| | | | 2 | N/A | 60° 46' 15.1" | 151° 16' 44.0" | 13.0 |
| | EFORE-L | Longline | 2 | 1 | 60° 45' 16.9" | 151° 17' 17.2" | 3.0 |
| | EFORE-M | SPMD Mooring | 1 & 2 | N/A | 60° 46' 16.3" | 151° 16' 47.3" | 10.9 |
| | EFORE-S | Sediment | 1 | 1 | 60° 45' 36.6" | 151° 17' 06.6" | 5.2 |
| | | | 1 | 2 | 60° 45' 39.0" | 151° 17' 11.3" | 5.6 |
| | | | 1 | 3 | 60° 45' 36.8" | 151° 17' 07.4" | 6.1 |
| | EFORE-T | Trawl | 1 | 1 | 60° 45' 50.2" | 151° 16' 48.5" | 6.0 |
| | | | 1 | 2a | 60° 45' 40.1" | 151° 17' 10.4" | 6.4 |
| | | | 1 | 2b | 60° 45' 48.1" | 151° 16' 39.2" | 4.9 |
| | | | 1 | 3 | 60° 45' 41.9" | 151° 17' 00.8" | 4.9 |
| Null Zone | NULLZ-H | Hydrographic | 1 | N/A | 59° 04' 58.9" | 152° 48' 58.4" | 143.5 |
| | NULLZ-S | Sediment and Bivalve Condition Index | 1 | 1 | 59° 04' 36.6" | 152° 48' 39.0" | 109.8 |
| | | | 1 | 2 | 59° 05' 01.1" | 152° 48' 46.9" | 109.0 |
| | | | 1 | 3 | 59° 05' 02.3" | 152° 48' 52.8" | 110.2 |
| Kachemak Bay | KACHB-H | Hydrographic | 1 | N/A | 59° 37' 56.7" | 151° 23' 47.4" | 16.5 |
| | | | 2 | N/A | 59° 38' 04.5" | 151° 23' 57.8" | 10.5 |
| | KACHB-L | Longline | 2 | 1 | 59° 38' 06.1" | 151° 23' 50.2" | 12.6 |
| | | | 2 | 2 | 59° 38' 02.0" | 151° 23' 52.0" | 13.3 |
| | | | 2 | 3 | 59° 38' 04.5" | 151° 23' 50.2" | 11.2 |
| | | | 2 | 4 | 59° 38' 08.6" | 151° 23' 44.6" | 8.5 |
| | | | 2 | 5 | 59° 37' 58.8" | 151° 23' 26.0" | 18.1 |
| | | | 2 | 6 | 59° 38' 15.0" | 151° 23' 53.5" | 10.7 |
| | KACHB-M | SPMD Mooring | 1 & 2 | N/A | 59° 37' 58.3" | 151° 23' 45.7" | 15.2 |
| | KACHB-S | Sediment and Bivalve Condition Index | 1 | 1 | 59° 37' 59.4" | 151° 23' 48.3" | 15.2 |
| | | | 1 | 2 | 59° 37' 57.1" | 151° 23' 47.4" | 14.4 |
| | | | 1 | 3 | 59° 38' 00.6" | 151° 23' 47.8" | 14.2 |
| | KACHB-T | Trawl | 1 | 1 | 59° 38' 04.5" | 151° 23' 32.9" | 14.0 |
| | | | 1 | 2 | 59° 38' 21.0" | 151° 22' 44.3" | 20.0 |
| | | | 1 | 3 | 59° 38' 12.9" | 151° 23' 29.6" | 14.0 |

Table 1. Sampling and Station Location Information for the CIRCAC 1995 EMP. (continued)

| Sampling Location | Station Designation | Type of Samples Collected | Survey | Replicate | Latitude (N) | Longitude (W) | Depth* (m) |
|---|---|---|---|---|---|---|---|
| Kamishak Bay | KAMIB-F | Fishing (Rod and Reel) | 2 | 1 | 59° 22' 34.6" | 153° 46' 15.4" | 17.7 |
| | KAMIB-H | Hydrographic | 1 | N/A | 59° 22' 36.4" | 153° 46' 00.6" | 17.0 |
| | | | 2 | N/A | 59° 22' 34.6" | 153° 46' 15.4" | 18.0 |
| | KAMIB-L | Longline | 2 | 1 | 59° 21' 05.2" | 153° 34' 36.7" | 7.4 |
| | | | 2 | 2 | 59° 21' 16.8" | 153° 33' 29.8" | 5.4 |
| | | | 2 | 3 | 59° 21' 18.9" | 153° 33' 17.5" | 3.6 |
| | | | 2 | 4 | 59° 22' 35.4" | 153° 46' 12.0" | 17.1 |
| | KAMIB-S | Sediment and Bivalve Condition Index | 1 | 1 | 59° 22' 35.8" | 153° 46' 02.3" | 15.0 |
| | | | 1 | 2 | 59° 22' 39.4" | 153° 46' 02.2" | 15.1 |
| | | | 1 | 3 | 59° 22' 35.4" | 153° 45' 56.7" | 15.1 |
| | KAMIB-T | Trawl | 1 | 1a | 59° 22' 13.3" | 153° 46' 59.9" | 11.6 |
| | | | 1 | 1b | 59° 22' 13.0" | 153° 47' 21.5" | 12.3 |
| | | | 1 | 2 | 59° 23' 00.4" | 153° 46' 48.2" | 13.0 |
| | | | 1 | 3a | 59° 22' 28.6" | 153° 45' 17.6" | 13.9 |
| | | | 1 | 3b | 59° 22' 55.7" | 153° 45' 46.1" | 14.0 |
| Southeast Kamishak Bay | SEKAM-H | Hydrographic | 1 | N/A | 59° 04' 52.6" | 153° 36' 53.3" | 14.5 |
| | SEKAM-T | Trawl | 1 | 1a | 59° 04' 48.7" | 153° 37' 19.3" | 13.8 |
| | | | 1 | 1b | 59° 04' 55.6" | 153° 37' 41.4" | 12.8 |
| Trading Bay | TRADB-H | Hydrographic | 1 | N/A | 60° 51' 38.1" | 151° 41' 36.3" | 13.5 |
| | | | 2 | N/A | 60° 48' 25.1" | 151° 42' 33.8" | 6.0 |
| | TRADB-L | Longline | 2 | 1 | 60° 48' 20.8" | 151° 42' 43.5" | 19.5 |
| | TRADB-M | SPMD Mooring | 1 & 2 | N/A | 60° 48' 35.8" | 151° 42' 34.4" | 7.0 |
| | TRADB-S | Sediment and Bivalve Condition Index | 1 | 1 | 60° 51' 33.0" | 151° 41' 42.9" | 10.3 |
| | | | 1 | 2 | 60° 51' 27.3" | 151° 41' 47.8" | 10.3 |
| | | | 1 | 3 | 60° 51' 24.6" | 151° 41' 50.9" | 10.3 |
| | TRADB-T | Trawl | 1 | 1 | 60° 51' 49" | 151° 42' 06" | 11.0 |
| | | | 1 | 2 | 60° 51' 46.2" | 151° 41' 16.9" | 10.0 |
| | | | 1 | 3 | 60° 52' 03.8" | 151° 40' 36.1" | 12.2 |

* Depths Adjusted to Mean Lower Low Water

N/A Not Applicable

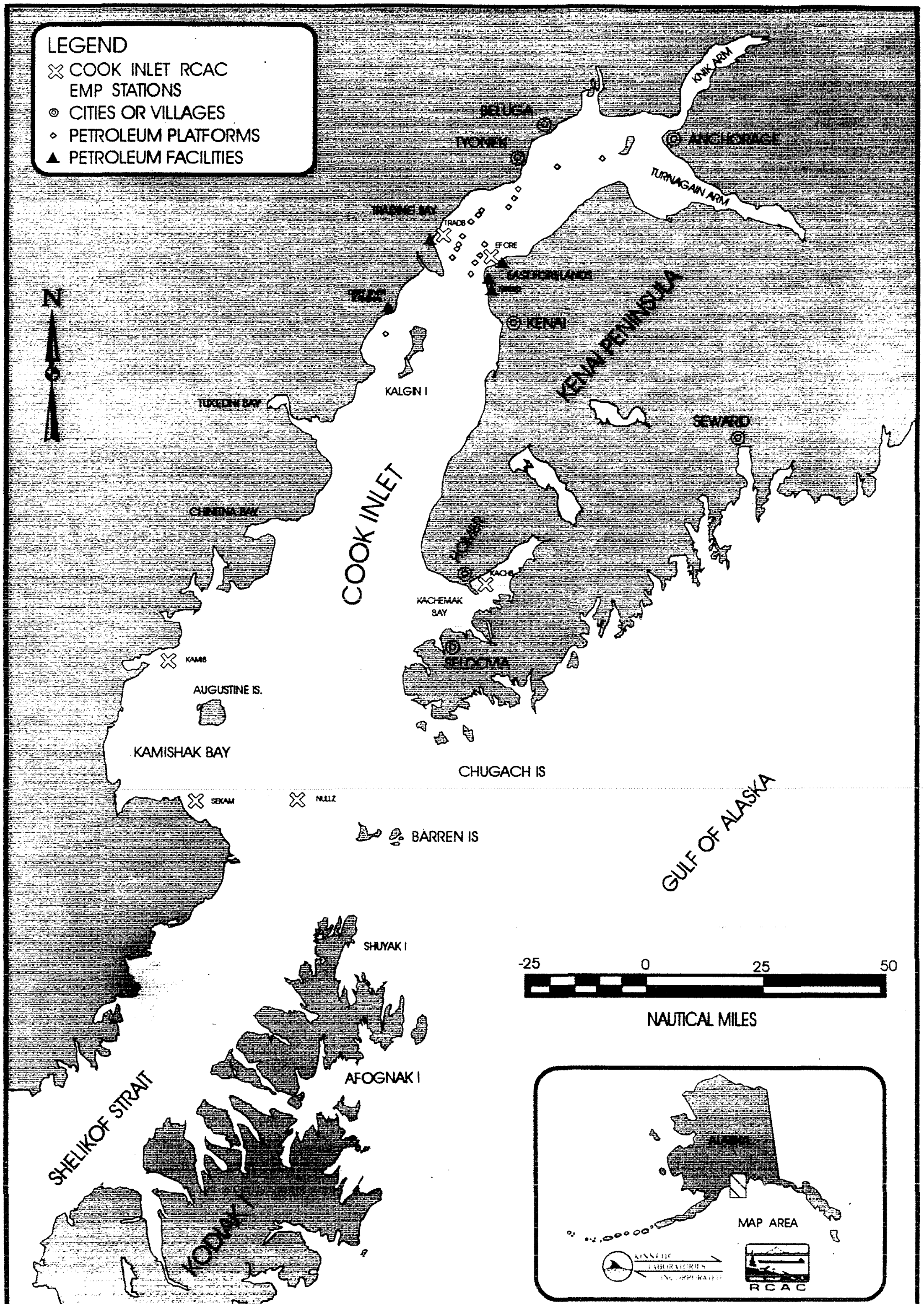



**Figure 1. General Study Area and Station Locations.**

**Table 2. Analytical Strategy.**

| ANALYSIS | MATRIX | METHOD | Example SAMPLE ID |
|---|---|---|---|
| Polycyclic aromatic hydrocarbons (PAH) | Sediment, SPMDs, field-collected water blanks | GC/MS in SIM mode with EPA Method 3540 and 3611 for Soxhlet extraction and fractionation, respectively (sediment). SPMDs were extracted using dialysis in hexane. | CIR95PTT0001 (sediment), CIR95SPM0001 (SPMD), CIR95PTB0001 (blanks) |
| Total hydrocarbons (THC) | | | |
| Total organic carbon (TOC) | Sediment | Combustion/Infrared | CIR95PTT0001 |
| Particle grain size (PGS) | Sediment | Dry sieving/Pipetting | CIR95PGS0001 |
| Biological condition | *Macoma* spp. and other bivalves | Condition Index=100 * tissue weight/ shell volume | CIR95BCI0001 |
| Toxicity testing | Sediment | Microtox® bioassay | CIR95MCT0001 |
| Biomarkers in fish bile | Demersal fish | Bile metabolite determination | CIR95BIL0001 |
| Biomarkers in fish liver | Demersal fish | Cytochrome P4501A induction | CIR95LIV0001 |
| Hydrographic measurements (depth, conductivity, salinity, temperature, transmissivity, dissolved oxygen, and pH collected *in situ*) | Water | Conductivity, Temperature, and Depth (CTD) instrument (Seabird® SBE-19) | CIR95CTD0001 |
| Dissolved Oxygen (DO); salinity; temperature; turbidity | Water (quality control samples) | Modified Winkler full-bottle test; electrical conductivity method; precision electronic thermometer; nephelometer | CIR95DOX0001; CIR95SAL0001; Not Applicable; CIR95NTU0001 |

### 1.2.2 Semi-Permeable Polymeric Membrane Devices

Semi-permeable polymeric membrane devices (SPMDs) are relatively new monitoring tools that are being developed to act as bioaccumulation surrogates. They consist of a low-density, semi-permeable polyethylene tubing containing lipid material that concentrates organics such as PAHs. When deployed in the marine environment, the lipid material performs similarly to lipid in living tissues, concentrating the contaminants, while the polyethylene (synthetic) membrane acts to mimic natural membranes which allow the transport of these contaminants from ambient waters into living tissues. After deployment, the lipid material and the tubing itself are extracted (or dialyzed) for hydrocarbon analysis. The SPMD approach has been used by the U.S. Fish and Wildlife Service's National Fisheries Contaminant Research Center and others (e.g., Huckins et al., 1990; Shigenaka and Henry, 1993) to help assess the bioavailability and bioconcentration of organic chemicals in organisms. It had also been used with some success on the pilot program. The SPMD method provides a potential alternative to bioaccumulation studies where living tissue cannot easily be collected, such as some areas of Cook Inlet, or to water quality programs where large volumes of water may need to be collected to obtain hydrocarbon signals above background. The SPMD technology is still developing and studies such as this, in conjunction with laboratory studies, will potentially lead to more regular use of SPMDs for applied monitoring programs.

### 1.2.3 Bioaccumulation in Fish

Historically, most environmental programs interested in the bioavailability of contaminants looked at the concentrations of these contaminants in the tissues of the organisms of interest. Because of metabolic processes, however, tissue PAH levels may not accurately reflect PAH exposure but often show only trace levels of PAH compounds. This is particularly true in fish due to the rapid conversion of hydrocarbon contaminants to metabolic products (Varanasi et al., 1989). In recent years, the use of biomarkers to evaluate exposure of organisms to contaminants has increased. Analyses of new types of biomarkers, including PAH metabolites from fish bile and cytochrome P4501A induction in fish livers, have increased over the last few years. For example, these two test methods indicated that PAH contamination is still affecting biota in the area of the wreck of the *Bahia Paraiso* which ran aground in Antarctica in 1989 (McDonald et al., 1995). Fish collected in the wreck area in 1993 exhibited elevated levels of these two types of biomarkers, indicating that PAH contamination was still occurring, while PAH concentrations determined in the liver tissue of these fish showed no significant difference from more remote sites.

To better assess the exposure of fish to PAHs, a technique was developed to estimate biliary levels of PAH metabolites (Krahn et al., 1984). Hepatic PAH and subsequent reaction metabolites are concentrated in the bile for elimination from the body (Varanasi et al., 1989). The levels of fluorescent aromatic metabolites in fish bile are correlated with PAH exposure (Collier and Varanasi, 1991; Krahn et al., 1984, 1992).

The use of cytochrome P4501A induction as a measure of contaminant exposure is based on the presence of the cytochrome P4501A in teleost (bony skeleton) fish. Cytochrome P450s are a large family of proteins which have a myriad of functions ranging from the hydroxylation of steroids, drugs, barbituates, and hydrocarbon contaminants. Hydroxylation of these types of foreign chemicals typically renders them more water soluble so they may be excreted. Cytochrome P4501A is a heme protein that is typically found in the smooth endoplastic reticulum of many tissues. It catalyzes reactions in which an organic substrate is hydroxylated using one atom of oxygen, with the other atom of oxygen being reduced to water.

Two enzyme activities catalyzed by this compound are aryl hydrocarbon hydroxylase (AHH) and ethoxyresorufin O-deethylase (EROD), both of which are typically low in animals unexposed to hydrocarbons. The concentrations of both AHH and EROD can be highly induced by exposure to selected hydrocarbons such as PAH, polychlorinated biphenyls (PCBs), dibenzofurans, and dibenzodioxins. Both AHH and EROD assays have been used successfully to assess hydrocarbon exposure in fish and, for most species, there is good accordance between the two assays (Collier et al., 1992, 1995). The method chosen for the CIRCAC program was the EROD assay, which was preferred because the substrate used for the test, ethoxyresorufin, is less toxic than the benzo(a)pyrene substrate used for the AHH assay. However, supplemental AHH analyses were performed on the same fish livers by Dr. Tracy Collier of the Northwest Fisheries Service Center, National Marine Fisheries Service (NMFS), NOAA, and these results have been included in the results section of this report.

### 1.2.4 Hydrographic Profiling

Hydrographic profiling was performed to help provide more information on the water column in the study area. Temperature, salinity, dissolved oxygen, transmissivity, and pH data were collected to help in the interpretation of the SPMD data.

## 2.0 METHODOLOGY

### 2.1 Field Methods

#### 2.1.1 Sediment

Subtidal sediment sampling was performed using a Teflon®-coated modified Van Veen grab (0.1 $m^2$). Three discrete replicate sediment samples were collected at each site, each involving a separate successful drop of the Van Veen grab. A grab was considered successful if the following criteria were met:

- The grab contained relatively undisturbed overlying water
- The sediment surface appeared largely undisturbed
- The grab contained sufficient sediment for the full suite of samples but had not over-penetrated the sediment.

After a successful grab, overlying water was decanted by slightly opening the grab jaws. Surficial sediment samples were collected from the top 0 - 2 centimeters (cm) of the sediment within the grab using a decontaminated custom-fabricated stainless steel scoop. The sides of the scoop were 2 cm high to allow easy depth determination. Chemistry samples were collected immediately upon grab retrieval, and sediment in contact with the grab's surface was not used. Sediment for the analysis of PAH, THC, and TOC was placed in a 250-milliliter (mL) labeled glass jar (pre-cleaned by the manufacturer, I-Chem®) equipped with a Teflon®-lined lid. A similar sample was collected for Microtox® and placed in a 125-mL pre-cleaned glass jar. Specimens of *Macoma* spp. or other bivalves were avoided during sampling or removed from these samples in such a way as to avoid contamination of the sediments. Sediment jars were filled, with minimal headspace remaining to allow expansion of the sample during freezing, and immediately frozen. Dry ice was used as needed to ensure rapid freezing. Sediment designated for PGS determination was placed in a labeled polyethylene Whirl-pak® bag and chilled until analysis by the laboratory.

The modified Van Veen grab and stainless steel utensils were decontaminated between each replicate or each failed replicate which brought up some sediment. Decontamination procedures used between replicates included the removal of residual sediment by rinsing with seawater, followed by rinsing with high-purity (high-performance liquid chromatography, HPLC) de-ionized water to remove traces of seawater. The gear was then rinsed with high-purity acetone, to remove residual water, and high-purity hexane, to remove hydrocarbons. The gear was allowed to briefly air dry before redeployment. Care was taken during the rinsing procedure to contact all interior surfaces of the grab and all surfaces of the utensil which could come into contact with the sediment. Between stations, an additional step of thoroughly washing the grab and utensils with Alconox® and rinsing with seawater was employed prior to following the decontamination procedure. Solvents and de-ionized water were dispensed from Teflon® squirt bottles. All solvent wastes were collected and returned to land for proper disposal. Quality control samples associated with grab sampling, field and equipment blanks, were collected as described in Section 2.1.6.

#### 2.1.2 Semi-Permeable Polymeric Membrane Devices

Moorings custom designed for use in the extreme current and high-sediment loading conditions of Cook Inlet were used to deploy the SPMDs for approximately four weeks. The moorings (Figure 2) consisted of a single primary array equipped with an underwater pinger (Efcom®), which transmitted in the 30-40 kHz frequency range, and a primary anchor. Flotation for the mooring was provided through surface and subsurface floats, with the surface float serving to suspend the top SPMD at 2.5 meters (m) below the water surface. The pinger was a contingency to be used to locate the mooring in the event that the surface float was vandalized or inadvertently removed by vessel traffic. The moorings consisted of non-corrosive components (e.g., stainless steel thimbles and shackles) and were deployed and retrieved through the use of a polypropylene ground line attached to a smaller secondary anchor.

Two SPMDs consisting of four lipid-filled bags each were deployed on each mooring at depths of approximately 2.5 m below the surface and approximately 2.5 m above the bottom. Each SPMD was contained in a stainless steel cage that was mounted on stainless steel cable placed in-line with the mooring. The cages were highly-perforated to allow flow

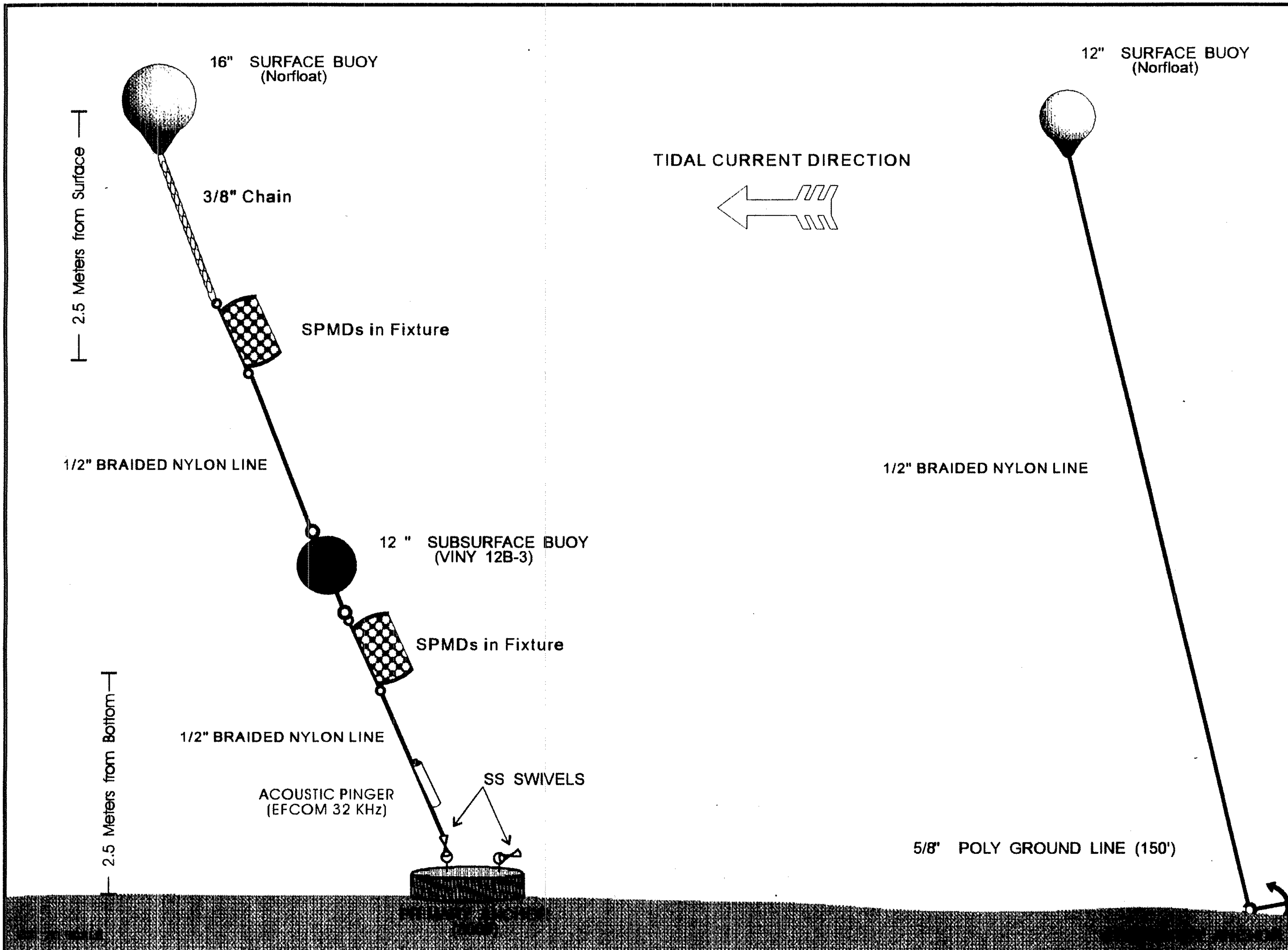



**Figure 2. Mooring Design for Semi-Permeable Polymeric Membrane Devices.**

of seawater over the SPMDs. Every effort was made during deployment and retrieval of the moorings to avoid potential contamination from vessel exhaust or other factors. This included the use of an electrical lifting system so that the vessel could be shut down during these activities. In addition, the vessel's diesel-burning galley stove was shut down during mooring activities. All SPMD samples were frozen on dry ice immediately after retrieval and remained frozen until processing at the laboratory. At each mooring station, an SPMD field blank was collected as described in Section 2.1.6.

### 2.1.3 Fish Collection

During the first survey, trawling for the collection of demersal fish was performed at each station. This provided a means of documenting the species found in each area so that subsequent sampling and chemical analyses of target species could be performed. A 25-foot (ft) Marinovich otter trawl with a stretch mesh of 1.5 inches and a cod end liner was used. The net was rigged with a 26-ft lead-rope and a 75-ft bridle and towed with a single line from the research vessel. Each tow was performed in daylight hours along a specific isobath at each of the stations into the prevailing current at approximately 2-2.5 nautical miles per hour speed over ground. Target bottom time (actual fishing time) of each tow was ten minutes, with tows terminated as needed due to obstructions on the bottom. When multiple trawls were performed at a site, each trawl was conducted so it would not overlap the previous trawl paths. After retrieval of the otter trawl, fish were immediately sorted and processed. Fish specimens were identified for species and sex, measured for standard length and wet weight, and visually examined for external tumors, parasites, or lesions. Fish were speciated and identifications confirmed, as needed, using a variety of references such as Kramer and O'Connell (1988), Kramer et al. (1995), Kessler (1985), Clemens and Wilby (1961), and Eschymeyer et al. (1983).

Due to the limited success of fish collection at some stations on the first survey using the trawl method, collection of fish specimens for biliary and liver analyses was carried out on the second survey using modified commercial longline gear. The longline gear consisted of a quarter-length self-weighted skate (400 ft) anchored at the terminal ends. The skate consisted of lead-core 5/16-inch braided nylon line with circle-hooks attached at approximately 15-ft intervals using commercial snap gangions. The hooks used were smaller (size 14) than standard halibut gear hooks (size 16) to facilitate catching the less mature of the target fish species. Hooks were baited prior to each set with either herring or squid. During the deployment, each baited hook was attached as the gear was sent over the side of the vessel. Deployment times for the longline gear were generally kept to a minimum (approximately 45 minutes) to minimize stressing the fish which could artificially induce enzyme production. At some stations, low fish densities required increased deployment time.

During the retrieval process, empty hooks were removed from the skate as the line was brought on board. If the hook had caught a species not intended for collection, that individual was released immediately and gear retrieval resumed. If the target species (Pacific halibut, *Hippoglossus stenolepis*) was encountered, retrieval was paused and the remaining length of skate still in the water was tied off so that immediate processing of the specimen could be performed. The target fish was brought on board, removed from the hook, weighed, and measured, and the necropsy was immediately performed.

The sample collection process was performed as quickly as possible, and the bile and liver tissue sampling for the majority of fish was completed within five minutes of collection. Dissection tools were thoroughly rinsed with methanol prior to use. After each fish had been sacrificed, the body cavity was opened. Bile was removed from the gall bladder without removing it from the body cavity by using a sterile Vacutainer® needle and vial. All bile samples were protected from light. Labeled bile samples were immediately frozen on dry ice and remained frozen until analysis.

Following the collection of the bile from each fish, a small sample (minimum of 1.0 g wet weight) of liver tissue was removed for cytochrome P4501A analysis. Visually obvious (gross) anomalies of each liver were recorded during the sampling process. Each liver sample was placed in a pre-labeled cryovial (Nalgene®) and chilled on gel ice for a short time (while other fish were being processed) and then placed in liquid nitrogen in a dewar for immediate freezing. Samples were shipped in liquid nitrogen to the laboratory using a specially-designed cryogenic sample shipper.

### 2.1.4 Hydrographic Profiling

Standard physical properties of water such as temperature, dissolved oxygen, pH, transmissivity, and salinity were collected *in situ* at each sampling station using a modified Seabird® SEACAT SBE-19 conductivity, temperature, and depth (CTD) instrument. Use of the CTD provided a continuous profile (surface to bottom) of water column measurements taken at 0.5 second intervals during the lowering and retrieving of the unit on a line. This unit was equipped with optional pH, dissolved oxygen (DO), and transmissivity sensors (25-cm transmissometer) along with a submersible profiling pump. The relatively shallow depths associated with nearshore stations necessitated the use of a pump to maintain adequate velocity across the sensors during low cast velocities. The pump facilitates equipment use in high suspended sediment locations and has been used successfully for many years by KLI in Cook Inlet. Quality control samples used to validate the CTD data were collected as described in Section 2.1.6.

Immediately following the CTD cast, the data were uploaded from the instrument memory to a field computer on board the survey vessel and verified. Data verification involved assessing that the profile data was complete and had not been corrupted. To ensure against data loss, a duplicate copy of the verified data was saved to a diskette.

Hydrographic data were compiled by averaging the time-collected (0.5 sec) samples to a given depth interval of every half meter. Use of depth-averaged data facilitates comparisons across stations, and these data are easier to read than time-series data. For most stations, the upcast was used for calculating depth averages to allow additional time for the CTD probes to equilibrate. Sequential sample identification numbers were then added to the post-processed data. The final data were then output as tables and plotted as standard hydrographic profiles (Appendix E).

### 2.1.5 Bivalve Condition Index

Following collection of the sediment samples from each grab, the grab contents were sieved through a 5-millimeter (mm) stainless steel mesh sieve. All visible specimens of bivalves, including *Macoma* spp., were removed from the sieve, enumerated, placed in labeled Whirlpak® bags, and frozen for later identification and processing.

### 2.1.6 Quality Control

Sampling procedures used on this program have a history of successful use on a large number of scientific programs. The use of documented and well-known procedures provided for greater likelihood of obtaining samples uncontaminated by procedures or apparatus. It also helped ensure that data collected over the course of the program were comparable and that the study results were representative of conditions existing at the sampling sites. In addition, use of sample documentation procedures and a chain of custody program, as described in Section 2.1.7, provided a paper trail to track each sample.

Quality control samples, equipment rinsate blanks and field blanks, were collected once during grab sampling. Equipment rinsate blanks used to verify grab decontamination procedures were collected by filling two pre-cleaned amber wide-mouth 950-mL glass jars with a high-purity de-ionized water rinse of the grab's inner surfaces. After the collection of the equipment blanks, the grab was re-cleaned prior to use. Field blanks consisted of high-purity de-ionized water poured into two amber glass 950-mL jars. Field and equipment blanks were preserved to a pH of <2 with 1:1 hydrochloric acid (HCl) immediately after collection. Samples were chilled at 4°C until extraction and analysis at the laboratory.

An SPMD field blank was collected at each station to help assess potential contamination of the SPMDs from airborne contaminants or other factors encountered in the field. Field blank SPMDs, consisting of four lipid-filled bags each, were exposed to field conditions during the deployment period when the moorings were being assembled and deployed. These labeled field blanks were placed in freezer storage during the four-week period when the moorings were deployed. Just prior to the retrieval of each mooring, the appropriate field blank SPMD for that station was removed from the freezer and allowed to thaw. The SPMD containers were opened during retrieval and disassembling of the mooring so that these blanks would be exposed to field conditions. Hence each SPMD field blank was exposed to environmental conditions encountered during both the deployment and retrieval process.

Samples for the determination of salinity, dissolved oxygen, turbidity, and temperature were collected using a Niskin® bottle at selected stations to validate CTD data. Salinity samples were shipped to the KLI Santa Cruz laboratory for analysis using an electronic probe method (Standard Method 2520B). Dissolved oxygen analysis was performed on board the sampling vessel using a modified Winkler full-bottle titration technique (Standard Method 4500-OC). Turbidity samples for qualitative comparison with transmissivity values from the CTD were also analyzed in the field using a Nephelometer. Water temperature was determined using a precision electronic thermometer immediately upon retrieval of the Niskin® bottle. Prior to use in the field, the CTD was calibrated at the factory for dissolved oxygen and pH.

### 2.1.7 Sample Documentation and Chain of Custody

Sample documentation was initiated in the field with the use of project-specific pre-printed forms such as sediment chemistry logs, grab and trawl effort logs, fish catch logs, sample identification/chain of custody forms, and sample labels. The Field Leader was responsible for review and approval of all field documentation.

Sediment logs provided information about the station, including project and survey designation, station designation, sample identification numbers, date, replicate depth and time, navigational information, observations of sediment characteristics, quality control sample collection, and names of recording personnel. Observations which may be recorded on this form include the appearance of the sediment and presence or characteristics of oiling, such as the presence or absence of sheening, as well as the recording of biological characteristics such as macroflora or macrofauna.

Sediment grab effort logs were used to record each drop of the grab and included station designation, date, time, and depth of drop, navigational information, and success or failure of each attempt. Trawl effort logs contained station designation, date, time, navigational information, length of tow, and bottom time. This type of information is generally intended for KLI's use and can be used to describe bottom type in specific areas, help determine sampling locations, and provide estimates of time needed to successfully sample in a given area as well as allowing the evaluation of equipment performance.

Sample identification and integrity was ensured by a chain of custody program. Sample Identification/Chain of Custody Forms (COCs) were used to provide specific information concerning the identification, handling, and shipment of all samples. Pertinent information from the sample label was transferred onto the COC, along with other information as required. COC forms were completed, signed by field personnel, and copied. The original of each form was packed with the samples for shipment to the laboratory. The Field Leader retained a copy of each form for the field records and for tracking purposes should a shipment become lost or delayed. Upon receipt of the samples at the analytical laboratory, the Laboratory Sample Custodian signed the samples in by checking all sample labels against the COC information and noting any discrepancies, as well as sample condition (e.g., samples broken during shipment). Internal sample tracking procedures at the laboratory were initiated immediately upon receipt of samples.

Pre-printed labels included project identification, analysis type, date of collection, and a unique pre-assigned sample identification number used to identify each sample. Sample numbers included a project designation, year, analysis type, and a sequential number (e.g., CIR95PTT0001, see Table 2). For the Vacutainer® and cryovials, sample identification numbers and sampling dates were recorded directly on the containers using low temperature-resistant markers.

### 2.1.8 Navigation

Navigation and station location included the use of nautical and topographic charts, radar, and a Global positioning system (GPS), a satellite-based system that is more accurate than Loran-C. A Trimble Ensign-XL® GPS was used for general navigation and to obtain the coordinates of all sampling, trawling, and mooring locations. Station locations (GPS longitude and latitude) were recorded on the appropriate logs.

### 2.1.9 Permitting

Invertebrate infauna and demersal fish collections were carried out under the auspices of KLI's 1995 Fish Resource Permit for Scientific, Educational, or Exhibitive Collections (Permit #DFG-95-8-SE-SC). This collection permit, issued by the Alaska Department of Fish and Game (ADF&G), authorizes KLI personnel to collect, analyze, and/or archive the marine fauna required by this program. In accordance with this permit, KLI notified ADF&G regional biologists prior to collection activities.

Additionally, the mooring deployment was carried out under a U.S. Army Corps of Engineers (COE) general nation-wide permit for scientific measurement devices (33 CFR Part 330, Appendix A, Subtitle B(5)). This permit allows for short duration deployments of scientific instruments, including oceanographic and/or water quality measuring devices, in the navigable waters of the United States without going through the formal permitting process required for permanent moorings. Prior to mooring deployment, KLI notified the U.S. Coast Guard (USCG) and COE, providing a description of each mooring and the proposed sampling locations. Authorization to proceed was received from both the COE and USCG, and the USCG published appropriate information in the *Notice to Mariners*. In addition, both agencies were notified by KLI after retrieval of the moorings.

## 2.2 ANALYTICAL METHODS

Sediment chemistry (PAH and THC), PGS, and TOC analyses, along with fish bile metabolites and liver tissue cytochrome P4501A induction analyses, were performed by the Geochemical and Environmental Research Group (GERG) Laboratory of Texas A & M University in College Station, Texas. Preparation and extraction of SPMDs were performed by Environmental Sampling Technologies (EST) in association with Dr. Harry Prest of Long Marine Laboratory, University of California at Santa Cruz. Determination of PAH and THC in SPMD extracts was performed by GERG. Microtox® testing was performed by KLI's bioassay laboratory in Watsonville, California. Determination of condition index of bivalves was performed at KLI in Santa Cruz, California.

Samples were analyzed following Standard Operating Procedures (SOPs) such as those listed in Table 3.

**Table 3. Analytical Standard Operating Procedures.**

| PROCEDURE | SOP NO. |
|---|---|
| Sample receipt/sample preparation | GERG SOP-9225 |
| Percent moisture determination (sediment) | GERG SOP-8902 |
| Sediment extraction (sonication method) | GERG SOP-9318 |
| Sediment extraction (soxhlet method) | GERG SOP-8902 |
| Polycyclic aromatic hydrocarbon determination | GERG SOP-8905 |
| Aromatic hydrocarbon metabolites in bile | GERG SOP-9009 |
| Total hydrocarbon determination | GERG SOP-9219 |
| Particle grain size analysis | GERG SOP-8908 |
| Total organic carbon analysis | GERG SOP-8907 |
| SPMD extraction (dialysis) | EST SOP E-15 |
| SPMD extract cleanup | GERG SOP-8903 |

Upon receipt at the laboratory, samples were checked in and shipping containers inspected for damage and to ensure accuracy of sample documentation. Laboratory personnel inspected each shipment to ensure that:

- Each sample was clearly marked and dated
- Each sample was collected in an appropriate container
- Each sample was properly preserved and temperature controlled, if necessary
- There was sufficient volume to perform the analyses
- The sample was in good condition
- Chain of custody form information matched the sample description and the label information.

Chain of custody forms were completed, and internal laboratory tracking procedures were initiated immediately upon receipt of samples. Unique laboratory identification numbers were assigned to each sample prior to storage or further processing. Sediment chemistry, SPMD, and bile samples were stored at -20°C until analysis. Liver samples for cytochrome P4501A induction analysis were stored in liquid nitrogen until analysis. Samples designated for PGS analysis were kept at 4°C. Water samples (blanks) were stored in the dark at or below 4°C.

### 2.2.1 Sample Preparation and Sediment Percent Moisture Determination

Sediment samples for PAH/THC/TOC were homogenized by stirring with a clean stainless steel or Teflon® utensil and subsampled as required for the individual analyses. An aliquot (approximately 1 g wet weight) for dry weight determination was removed, weighed, freeze-dried, and reweighed to determine percent moisture (GERG SOP-8902). A 30-g (approximately) wet weight aliquot for PAH/THC analysis was placed in a labeled pre-combusted jar for chemical drying with sodium sulfate until the sample was dry, free-flowing, and homogeneous. Remaining sediment was also dried for archival.

Sediment samples designated for PGS analysis were homogenized and subsampled prior to analysis (GERG SOP-8908). Excess PGS sediment was archived at 4°C. Water samples (field blanks) were stored in the dark at or below 4°C until extraction. No further processing was required for these samples.

Just prior to extraction, all sediment hydrocarbon samples and quality control samples were spiked with deuterated surrogate solutions. The PAH surrogate solution contained naphthalene-$d_8$, acenaphthene-$d_{10}$, phenanthrene-$d_{10}$, chrysene-$d_{12}$, and perylene-$d_{12}$. Sufficient surrogate solution was added to each sample to provide a final concentration (of extract volume) of 20 and 40 ng/mL for sediment and water, respectively.

The SPMDs were prepared using 3-mil thick polyethylene tubing that had been pre-extracted. Lipid material used in the bags consisted of triolein lipid with a purity of 95 percent. A permeations standard which allowed for approximate corrections for temperature and biofouling effects was used. As in the pilot program, SPMDs were prepared and extracted under the direction of Dr. Harry Prest of the Long Marine Laboratory, University of California at Santa Cruz. Instrumental PAH analysis was performed at GERG by Dr. Thomas McDonald and his staff.

### 2.2.2 Extraction Procedures for Hydrocarbon Determination

Sediment extraction procedures followed those described by EPA Method 3540 (US EPA, 1986) and GERG SOP-8902, which includes a soxhlet procedure to ensure full contact of the extraction solvent with the sediments. Thirty g (wet weight) of sediment were chemically dried and extracted using acetone and dichloromethane (methylene chloride). The extract was concentrated and then treated using alumina column purification to remove matrix interferences.

For three select samples collected during the pilot program, a comparison of the soxhlet and sonication extraction procedure was performed by GERG to evaluate extraction efficiency. Samples splits from the pilot program were provided to GERG for this comparison. The sonication procedure used was based on EPA Method 3550 as described in GERG SOP-9318.

Fractionation of the sediment extracts was accomplished following EPA Method 3611 which includes specific guidance for separation of petroleum wastes into distinct fractions containing aliphatics, aromatics, and polar compounds. All extracts were stored at or below 4°C prior to and after analysis.

Extraction of SPMDs was performed by dialysis in hexane in an incubator at 18° C for 48 hours. Following incubation, the dialysate was subject to gas chromatographic (GC) column and High Pressure Liquid Chromatograph (HPLC) cleanup and fractionation using the same procedures used for tissue extracts (GERG SOP-8903).

Extraction of water samples (field-collected blanks) was performed using serial methylene chloride. All extracts were stored at or below 4°C until analysis.

### 2.2.3 Determination of Total Hydrocarbons

Total hydrocarbons (THC) were determined after extraction and prior to fractionation by measuring the weight of the sample extract as described by GERG SOP-9219. This method provided a measure of the total extractable material in a sample minus the polar-type compounds. Results were reported in $\mu$g/g dry weight for sediment and water blanks and mg/SPMD for SPMDs.

### 2.2.4 Determination of Polycyclic Aromatic Hydrocarbons

Polycyclic aromatic hydrocarbons and their alkylated homologues as provided in Table 4 were determined using a GC/MS technique in the selected ion monitoring (SIM) mode as described by GERG SOP-8905. Gas chromatographic (GC) separation was accomplished on a fused-silica capillary column with a DB-5 bond phase. The GC column fed directly into the ion source of the mass spectrometer (MS) operating in the SIM and electron-impact ionization mode. A computer system interfaced with the MS continuously acquired and stored all mass-spectral data during the analysis. This system also allowed display of a GC/MS data file for ions of specific mass and plotting ion abundances versus time or scan number.

Extracts were spiked with internal standard solutions prior to analysis. Internal standards of fluorene-$d_{10}$ and benzo(a)pyrene-$d_{12}$ were used. In addition, matrix spike standard solutions consisting of 2 to 5-ring PAHs were used for quality control matrix spike samples as described in Section 2.2.11.

Results for each sediment and field-collected blank PAH analyte were reported in ng/g in dry weight. Results for SPMDs were reported in ng/SPMD. Method detection limits (MDLs) for each sediment PAH analyte, defined as the lowest concentration of analyte that a method can reliably detect, were calculated by performing analyses on pre-extracted sediment following procedures outlined in the Federal Register 40 CFR Part 136, Appendix B (1986). MDLs were estimated for analytes not available in the spike solution or in the actual matrix by using the closest related compound. Since no MDLs exist for SPMDs, MDLs determined for tissue matrices were applied to the SPMD data. This was appropriate because the SPMDs are composed of lipids, as are tissues, and they behave like tissues in terms of possible matrix interferences and other analytical factors. Tissue MDLs were determined following the same procedure on clean tissue material.

### 2.2.5 Particle Grain Size Determination

The determination of PGS was performed using a method adapted from Folk (1974) as described by GERG SOP-8908. Sediment samples were homogenized and a subsample of 15 - 20 g was removed for analysis. The subsample was treated and washed to oxidize organic matter and remove soluble salts prior to the addition of dispersant. After agitation, the sediment solution was sieved to separate the gravel/sand fraction from the silt/clay fraction. Dry-sieve techniques were then used to determine the sand and gravel fractions. Silt and clay fractions were determined by pipetting. Results were reported in percent gravel, sand, silt, and clay on a dry weight basis. Duplicate samples were analyzed for quality control purposes as described in Section 2.2.11.

## Table 4. List of Target Analytes for PAH Analysis.

| Polycyclic Aromatic Hydrocarbons (PAH) | | |
|---|---|---|
| Compound | Internal Standard Reference | Surrogate Reference |
| Naphthalene | A | 1 |
| $C_1$-Naphthalenes | A | 1 |
| $C_2$-Naphthalenes | A | 2 |
| $C_3$-Naphthalenes | A | 2 |
| $C_4$-Naphthalenes | A | 2 |
| Biphenyl | A | 2 |
| Acenaphthylene | A | 2 |
| Acenaphthene | A | 2 |
| Fluorene | A | 2 |
| $C_1$-Fluorenes | A | 2 |
| $C_2$-Fluorenes | A | 2 |
| $C_3$-Fluorenes | A | 2 |
| Phenanthrene | A | 3 |
| Anthracene | A | 3 |
| $C_1$-Phenanthrenes/Anthracenes | A | 3 |
| $C_2$-Phenanthrenes/Anthracenes | A | 3 |
| $C_3$-Phenanthrenes/Anthracenes | A | 3 |
| $C_4$-Phenanthrenes/Anthracenes | A | 3 |
| Dibenzothiophene | A | 3 |
| $C_1$-Dibenzothiophenes | A | 3 |
| $C_2$-Dibenzothiophenes | A | 3 |
| $C_3$-Dibenzothiophenes | A | 3 |
| Fluoranthene | B | 3 |
| Pyrene | B | 3 |
| $C_1$-Fluoranenes/Pyrenes | B | 3 |
| Benzo(a)anthracene | B | 4 |
| Chrysene | B | 4 |
| $C_1$-Chrysenes | B | 4 |
| $C_2$-Chrysenes | B | 4 |
| $C_3$-Chrysenes | B | 4 |
| $C_4$-Chrysenes | B | 4 |
| Benzo(b)fluoranthene | B | 4 |
| Benzo(k)fluoranthene | B | 4 |
| Benzo(e)pyrene | B | 4 |
| Benzo(a)pyrene | B | 4 |
| Perylene | B | 5 |
| Indeno(1,2,3-c,d)pyrene | B | 4 |
| Dibenzo(a,h)anthracene | B | 4 |
| Benzo(g,h,i)perylene | B | 4 |
| **Specific Isomers** | | |
| 1-methylnaphthalene | A | 1 |
| 2-methylnaphthalene | A | 1 |
| 2,6-dimethylnaphthalene | A | 2 |
| 1,6,7-trimethylnaphthalene | A | 2 |
| 1-methylphenanthrene | A | 3 |
| **Internal Standards** | | |
| Fluorene-$d_{10}$ | A | |
| Benzo(a)pyrene-$d_{12}$ | B | |
| **Surrogates** | | |
| Naphthalene-$d_8$ | | 1 |
| Acenaphthene-$d_{10}$ | | 2 |
| Phenanthrene-$d_{10}$ | | 3 |
| Chrysene-$d_{12}$ | | 4 |
| Perylene-$d_{12}$ | | 5 |

## 2.2.6 Total Organic Carbon Analysis

Total organic carbon analysis was performed as described by GERG SOP-8907 using a 500-mg aliquot of freeze-dried sediment. The sediment was placed in an induction furnace designed to burn samples in an oxygen atmosphere. Gases produced by the combustion were processed and put through an infrared detector for quantification of carbon dioxide. Total organic carbon was determined after sample acidification. Carbonate carbon (inorganic carbon) was determined as the difference between total carbon and TOC. Results were reported in percent TOC and percent total inorganic carbon (TIC, or carbonate carbon) on a dry weight basis. Duplicate and reference standard samples were analyzed for quality control purposes as described in Section 2.2.11.

## 2.2.7 Microtox® Bioassay

Microtox® testing was performed following procedures described in the Microtox® Operating Manual (Beckman Instruments, 1982) and by Bulich et al. (1981). The Microtox® method depends on a bioluminescent bacterium (*Photobacterium phosphoreum)* which produces light from its electron transport system. This natural luminescence indicates the metabolic state of the bacteria. When the bacteria are dosed with a chemical contaminant, decreased bioluminescence is indicative of toxicity, and measurement of the amount of decrease over time is used as a quantitative measure of toxicity.

The bioassay included the use of a chemical extraction procedure specific for neutral compounds such as aromatic and chlorinated hydrocarbons. It is not specific for metals or other types of contaminants such as acidic and basic organic compounds. Extraction procedures followed those provided in *Recommended Protocols for Conducting Laboratory Bioassays on Puget Sound Sediments* (TetraTech, Inc. and E.V.S. Consultants, 1986). Organic extraction of 3.3 g subsamples of sediment was accomplished using spectral-grade dichloromethane as the extraction solvent and sodium sulfate as a drying agent. Samples were centrifuged during the triple-extraction procedure to increase extraction efficiency. The extract was concentrated and volume-adjusted through boiling (60°C water bath), use of a tube heater, and the addition of dichloromethane, hexane, and ethanol. Extraction blanks were prepared for quality control purposes by following an identical procedure without the sediment.

Freeze-dried bacteria were prepared for testing by reconstituting with distilled charcoal-filtered water and placed in Microtox® cuvettes. A stock test solution of each sediment extract and Microtox® diluent was prepared. Five dilutions (100, 50, 25, 12.5, and 0 percent) of this stock test solution were prepared for each sample and adjusted to 2 percent sodium chloride (NaCl) using a NaCl solution. The 0 percent dilution was a reagent blank that was used to measure the natural decrease of light production which occurs in the bacteria independent of treatment.

Five Microtox® cuvettes were prepared with a 20 $\mu$L aliquot of the bacterial suspension and 500 $\mu$L of the Microtox® diluent. After incubation of each cuvette for 15 minutes (min) to ensure temperature equilibration, light emission was measured to obtain initial levels prior to addition of the extract. The extract dilutions were added to the cuvettes at regular time intervals to ensure measurement prior to the gradual natural decrease in bioluminescence. Each dilution of every sample, including the 0 percent dilution (reagent blank), was tested in duplicate for a total of ten cuvettes per sample.

Light emission was measured exactly 5 min after the addition of the extract dilutions and again at 15 min after extract addition. Linear regression analyses were used to estimate the 15-min $EC_{50}$, which was defined as the concentration of extract required to cause a 50-percent reduction in bioluminescence. These analyses took into effect the percent decrease of bioluminescence recorded at each test concentration (100, 50, 25, and 12.5 percent) over the period of the test normalized for the natural decrease in light production over time (from the reagent blank at 0 percent). An additional statistical procedure was used where appropriate to calculate a 95-percent confidence interval for the $EC_{50}$.

## 2.2.8 Analysis of Bile Metabolites

Metabolite concentrations were determined using an HPLC system with fluorescence detection as described in GERG SOP-9009. Aromatic compounds that fluoresce at excitation/emission wavelengths of benzo(a)pyrene, naphthalene, and phenanthrene were analyzed. This method followed that of Dr. Margaret Krahn of NOAA (Krahn et al., 1984; 1986a;

1986b; 1992). For each sample, a small subsample of bile was thawed and injected directly onto the HPLC system. Fluorescence detector response was recorded with a computer for 35 minutes at three different excitation/emission wavelengths for benzo(a)pyrene (380/430 nm), phenanthrene (257/380 nm), and naphthalene (292/335 nm). Aromatic compounds fluorescing at naphthalene, phenanthrene, and benzo[a]pyrene wavelengths were analyzed. Metabolites eluting from the column within specific retention times were summed to yield total fluorescence based on equivalents of known amounts of napthalene, phenanthrene, and benzo[a]pyrene standards . Bile metabolites were reported in ng/g wet weight. Quality control associated with this type of analysis is described in Section 2.2.11.

### 2.2.9 Cytochrome P4501A Induction

Enzyme activity for ethoxyresorufin O-deethylase (EROD) was measured on microsomal preparations using a fluorometric procedure modified from that of Pohl and Fouts (1980). Microsomes may be defined as ultra-microscopic bodies present in cell cytoplasm that are rich in ribonucleic acid (RNA) and that function in protein synthesis. Microsomal preparations were made following modifications of an ultra-centrifugation procedure described by Stegeman et al. (1987). Fish liver samples were removed from liquid nitrogen, weighed, homogenized, and differentially centrifuged in a buffer solution. After centrifuging, microsomes were stored in a buffer containing glycerol in liquid nitrogen until analysis. A split of each microsomal preparation was forwarded to Dr. Tracy Collier of the Northwest Fisheries Service Center, NOAA, where AHH analysis was performed.

At GERG, each sample was analyzed in triplicate to obtain the EROD value. A reaction mixture was prepared using 250 $\mu$g of the thawed microsomal protein in a pH buffer (HEPES), along with bovine serum albumin (BSA) and several enzyme co-factors (magnesium chloride, NADH, and NADPH) that supplied energy and were necessary for the reaction to proceed. Samples were placed in a temperature-controlled water bath at 25 or 30°C for two minutes, after which 50 $\mu$L of the EROD substrate was added. The reaction was allowed to proceed for 10 minutes and terminated by the addition of 2.5 mL methanol. After centrifuging, each supernatant was read on a spectrofluorometer at 550 nm excitation and 585 nm emission wavelength settings. Enzyme concentrations based on the fluorometric units were derived using calibration curves based on resorufin. The protein precipitate from each sample was also measured by the method of Bradford (1976), and sample results were reported in picomole per minute per milligram (pmol/min/mg) of microsomal protein for each of the two temperatures run. For quality control purposes, duplicate microsomal preparations were made from selected liver samples (see Section 2.2.11).

### 2.2.10 Biological Condition Index

Biological condition index of *Macoma* spp. and other bivalve individuals were determined by measuring the dry weight (g) of the bivalve tissue, dividing it by the shell volume (cc), and multiplying by 100. This followed the formula developed by Haven (1962) and that used on the pilot program.

### 2.2.11 Quality Control

Analytical quality control for this program included the following:

- Adherence to documented procedures, particularly SOPs
- Calibration of analytical instruments
- Determination of method detection limits
- Use of quality control samples, internal standards, and surrogate solutions.

The analytical laboratories involved with this program operate under internal quality assurance (QA) programs described in their QA management plans. These programs involve the participation of qualified and trained personnel; the use of standard operating procedures for analytical methodology and procedures; a rigorous system of documenting and validating measurements; maintenance and calibration of instruments; and the analysis of quality control samples for precision and accuracy tracking.

Documentation in the laboratory included finalizing the original chain of custody forms and generating the internal documents that track samples through the laboratory. Any deviations from analytical SOPs were documented in the project files. Data affected by such deviations were appropriately qualified using the codes provided in Table 5. The analytical SOPs are comprehensive and provide information concerning proper sample collection, storage, and preservation; required apparatus and materials; analytical procedures; standardization techniques; quality control samples required; methods of calculating values and assessing data quality; the calibration of instruments; and reporting and performance criteria.

**Table 5. Qualifiers for Data Reporting.**

| Data Code | Description |
|---|---|
| B | Analyte reported in blank |
| D | Sample diluted in order to analyze, therefore surrogate is diluted |
| J | Quantity below the estimated MDL |
| ND | Not detected (not measured above zero) |
| NA | Not applicable |
| M | Matrix interference |
| N | Values identified as not within QC criteria |
| Q | Does not meet QA criteria |
| Y | Values within QC criteria |

The method detection limits (MDLs) for the sediment PAH analysis were determined following the method detailed in 40 CFR Part 136, Appendix B. The MDL is defined as the lowest concentration of analyte that a method can reliably detect. The MDLs were determined by calculating results of seven replicate measurements of one low-level or spiked sample. The results of a Student's t-test at the 99 percent confidence level was multiplied by the standard deviation of the seven replicates to obtain the lowest possible concentration that is quantifiable at this 99 percent confidence limit (i.e., that is not considered an estimate). The MDL was adjusted for sample size for each individual sample for reporting purposes. Analyte concentrations falling below the calculated MDL but above zero (0) were considered estimates and were qualified with the "J" qualifier. Concentrations equal to zero (0) were not measured and were qualified with the "ND" code for non-detect.

Internal laboratory quality control checks included the use of surrogate solutions, internal and calibration standards, and quality control samples such as blanks (procedural, reagent, or extraction), matrix spike/spike duplicates, standard reference materials (SRMs), reference samples, and duplicates. In addition, for Microtox® only, a reference toxicant (phenol) and negative controls were used. A summary of these internal quality control checks and the acceptable results criteria is provided in Table 6.

Surrogate compounds were spiked into PAH/THC sediment samples prior to extraction to measure individual sample matrix effects which are associated with sample preparation and analysis. Similarly, spike compounds were added to the SPMD extracts prior to instrumental analysis. This included QC samples such as field-collected blanks, procedural blanks, and matrix spike samples as appropriate. Surrogate compound analyses were reported in percent recovery. Analyte results were not corrected when surrogate recoveries fell outside the 40 to 120 percent limits, but the affected values were qualified using the appropriate qualifier.

## Table 6. Schedule of Internal Quality Control (QC) Checks and Acceptance Criteria.

| Type of QC | Type of Analysis | | | | | | |
|---|---|---|---|---|---|---|---|
| | **PAH** | **THC** | **PGS** | **TOC** | **MICROTOX®** | **BILE METABOLITES** | **P4501A (EROD)** |
| Surrogate Spike Solution | Sediment & SPMD: all samples and QC samples; 40 - 120 % | | | | | | |
| Procedural Blank | Sediment & SPMD: 1 in 20 samples or 1 per batch; < 3x MDL | Sediment & SPMD: 1 in 20 samples or 1 per batch | | 1 in 20 samples or 1 per batch; < 3x MDL | Extraction blank; 1 per batch | 1 in 10 samples or 1 per batch | 1 in 10 samples or 1 per batch |
| Matrix Spike/Matrix Spike Duplicate (or Blank Spike/Spike Duplicate) | Sediment only: 1 in 20 samples or 1 per batch; average of all compounds 40 - 120 %. See also duplicate (below). | | | | | | |
| Standard Reference Material (SRM) | Sediment only: 1 in 20 samples or 1 per batch for sediment PAH only; average values should be within ±30 % of certified values; no single value should deviate more than ±35 % from certified value | | | Reference material used as calibration standard; values must fall within laboratory's calibration curve | | | |
| Reference Material (Check Standard or Reference Oil) | Sediment & SPMD: 1 in 20 samples or 1 per batch; averages, standard deviations, and ranges are calculated to provide an estimate of precision | | | | Phenol tested as a reference toxicant with each batch; EC$_{50}$ typically 13 - 26 mg/L | Analyzed with each sample batch and must have an RSD of less than ±15% of the previous value and ±25% for each batch | |
| Duplicate | Sediment only: 1 in 20 samples or 1 per batch | Sediment only: 1 in 20 samples or 1 per batch | 1 in 20 samples or 1 per batch; used for qualitative assessment of homogeneity of sediment | 1 in 20 samples or 1 per batch; ±20 % for low level (<1.0 %) carbon samples and ±10 % for normal/high carbon (>1.0 % carbon) | Each dilution of each sample is run in duplicate | 1 in 10 samples | 1 in 10 samples (for microsomal preparation); each EROD value is the result of triplicate analyses |

Internal standards and calibration standards were used as required by the analytical SOPs as described in the appropriate analytical method section. For example, internal standard solutions were spiked into each PAH extract prior to analysis. Three calibration standards were analyzed at the beginning of each sample run of bile metabolites.

A procedural blank, typically consisting of HPLC water, was run with each batch of field-collected QC blanks for PAH and THC. For Microtox® testing, an extraction blank consisting of a centrifuge tube subject to the entire extraction procedure was run with each batch of sediment. For Microtox® testing, a reagent blank (with 0 percent sediment extract) was performed in duplicate for every sample tested, as described in Section 2.2.7. Procedural blanks were also analyzed with bile metabolites and cytochrome P4501A induction analyses. Procedural blanks were subject to the entire procedure as though they were normal samples.

Matrix spike and matrix spike duplicates were run with every each batch or for every 20 PAH/THC sediment samples, whichever was more frequent. For this type of quality control analysis, a sample was randomly chosen and split into three subsamples. Two of these subsamples were fortified with the matrix spike solutions. All three subsamples were analyzed following routine procedure and reported in percent recovery of the matrix spike solution. Relative percent differences between matrix spikes and their duplicates were computed.

The SRMs that were used for the program in conjunction with sediment PAH were obtained from the National Institute of Standards and Technology (NIST SRM 1941). In addition, laboratory reference oils consisting of laboratory-prepared crude oil standards were analyzed with each batch of PAH and THC sediment samples. Results of the reference oil analyses were used to provide an estimate of precision over the course of the analysis. Reference bile material was also analyzed and results compared against laboratory control charts. Descriptive statistics calculated from these results may include averages, standard deviations, and ranges. For the analysis of TOC, SRMs were also analyzed.

Duplicate samples were analyzed for a number of parameters by splitting samples into two subsamples and analyzing following normal protocols. For Microtox® testing, each dilution of each sample extract was run in duplicate.

For Microtox® testing, two additional types of QC were involved. Phenol was used as the reference toxicant as recommended by the Microbics Corporation. Phenol assays (a total of six) were performed concurrently with each set of sediment extracts and the results were compared to a typical phenol $EC_{50}$ of between 13 and 26 mg/L. This provided a means of assessing the sensitivity of the test bacteria. In addition, the reagent blank performed in duplicate for each sediment sample acted as a negative control to help evaluate test results.

## 2.3 DATA MANAGEMENT AND ANALYSIS

### 2.3.1 Data Management

Analytical data were generally obtained from the laboratories on 3.5 inch diskettes in DBASE® format. These raw data included sample identification numbers and results only since the samples were sent to the laboratory blind (without station and sampling information). Field sampling and other information was entered into Microsoft Excel® for Windows® spreadsheets and visually checked against field records. Raw data files were processed and entered into a relational database in Visual FoxPro® (Version 3) consisting of nine tables (Table 7).

This database was used for all aspects of data storage, error checking, and reporting. Error checking involved the use of "clean sweep" type programs written in FoxPro® along with visual checking of softcopy data stored in the database against hardcopy reports provided by the analytical laboratories or other pertinent records (e.g., field logs). Data reports provided in the appendix of this report were generating using the report writing functions in Visual FoxPro®. Data on which statistical analyses were performed were transferred directly from the database to Microsoft Excel® spreadsheets for processing. Statistical analyses were performed using either SYSTAT for Windows® Version 5.05 or PRODAS® Version 3.2A.

Table 7. Tables in the Cook Inlet 1995 EMP Database.

| TABLE | CONTENTS |
|---|---|
| STATION | field sampling information on a by-station basis |
| SAMPLE | field sampling and sample shipment information on a by-sample basis |
| ANALYSIS | analytical method and handling data on a by-sample and analysis basis, for field-collected samples |
| RESULT | analytical results on a by-sample, analysis type, and individual analyte basis, for field-collected samples |
| QCANAL | analytical method and handling data on a by-sample and analysis basis, for quality control samples originating in the laboratory |
| QCRESULT | analytical results on a by-sample, analysis type, and individual analyte basis, for quality control samples originating in the laboratory |
| COC | chain of custody (COC) data on a COC basis |
| COC_XFER | COC information on a COC, relinquish date, and time basis |
| VALIDVAL | provides valid values that may be found for different types of fields in the other tables (a look-up table) |

### 2.3.2 Data Handling

Certain conventions were used in preparing the data for statistical analysis. This approach is often used to help eliminate the bias in estimating population parameters in environmental data sets that are "censored to the left" due to zeros or values below the limit of detection for some of the analytes (Gilbert, 1987). When calculating summed or ratio parameters, all values and estimated values were used. This includes those values that were below the MDL, as indicated with a "J" qualifier. Within the scientific community, there is a great deal of debate concerning this practice. However, use of data below the MDL is considered valid and useful, particularly when assessing low-level environmental contamination (EPA, 1993). In addition, due to the rigorously-defined statistically-based concept of the MDL as defined by GERG, the data below the MDL are more likely to contain false negatives (reporting non-detects when concentrations actually do exist) than false positives (reporting erroneous values above non-detect when no such concentrations exist). It should be remembered, however, that there is a lower statistical confidence associated with these below-MDL values than those values reported as above the MDL.

For parameters where individual analytes were used for calculating statistical values (e.g., means) or indices, non-detect concentrations represented with a zero (0) value and/or the "ND" qualifier were assigned a value of 0.05 ng/g, which is less than one-half the lowest reported concentration in the data set. This method has been shown to cause less bias in estimating population parameters than several alternative methods (Gilbert, 1987).

### 2.3.3 Statistical Design

This program was designed to provide sufficient data to test the null hypothesis as stated in Section 1.2. The sediment and SPMD hydrocarbon parameters subject to statistical hypothesis testing included Total PAH, THC, and the fossil fuel pollution index (FFPI; Boehm and Farrington, 1984), as described in Table 8.

Total PAH and THC indicate the total level of hydrocarbon input at a site but provide no information on the possible sources (i.e., contamination of petrogenic, biogenic, pyrogenic, or diagenic origin; see glossary). The FFPI is the ratio of fossil fuel-derived PAH to TPAH (fossil + pyrogenic + diagenic). A high FFPI is indicative of fossil fuel (petrogenic) input, and a low FFPI is indicative of pyrogenic (combusted) and diagenic inputs. The use of ratios such as the FFPI is useful for determining potential sources of petroleum in sediments but may be less so in SPMD analyses because of potential preferential uptake of PAHs due to environmental factors, such as water temperature or membrane permeability.

Table 8. Hydrocarbon Parameters used in Hypothesis Testing.

| PARAMETER | RELEVANCE |
| --- | --- |
| Total PAH | As determined by high resolution GC/MS with quantification by selected ion monitoring. Defined as the sum of 2 to 5-ring polycyclic aromatic hydrocarbons: naphthalene + fluorene + dibenzothiophene + phenanthrene + chrysene, and their alkyl homologues + other PAHs (excluding perylene, a compound which often occurs naturally). Useful for determining levels of PAH contamination. |
| THC | Total hydrocarbons defined as the weight of the sample extract following extraction but prior to fractionation. This method provides a measure of the total extractable material in a sample minus the polar-type compounds. |
| FFPI | The fossil fuel pollution index is the ratio of fossil-derived PAHs toTPAH and is defined as follows:<br>FFPI = (N + F + P + D)/TPAH x 100, where:<br>N (Naphthalene series) = $C_0$-N + $C_1$-N + $C_2$-N + $C_3$-N + $C_4$-N<br>F (Fluorene series) = $C_0$-F + $C_1$-F + $C_2$-F + $C_3$-F<br>P (Phenanthrene/Anthracene series) = $C_0$-A +$C_0$-P + $C_1$-P + $C_2$-P + $C_3$-P + $C_4$-P<br>D (Dibenzothiophene series) = $C_0$-D + $C_1$-D + $C_2$-D + $C_3$-D<br>FFPI is near 100 for petrogenic PAH; FFPI for pyrogenic PAH is near 0 (Boehm and Farrington, 1984). |

Other parameters used for hypothesis testing included the biliary metabolites, liver P4501A enzyme induction analyses, and bivalve condition index. Toxicity and hydrography data were not examined using statistical methods.

### 2.3.4 Data Analysis

The data analyses performed for this program fell into three main categories:

- Data summary, graphical presentation, and descriptive statistics
- Data screening and transformation, including variance testing and testing of correlation of concomitant variables
- Hypothesis testing.

Figure 3 depicts the flow of data as they were analyzed for this program.

Data summary and descriptive statistics included measures of dispersion, such as mean and standard deviation. Graphical presentations of the data were used to allow visual interpretation of the data set such as scatter of the data points.

Concentration data for PAH and THC were transformed prior to statistical analysis using a logarithmic transformation ($\log_{10}(x+1)$). Non-linear transformations such as the $\log_{10}(x+1)$ are commonly used with environmental data sets since these types of data tend to be skewed and transformations can satisfy the assumptions for normality without seriously violating the integrity of the data (Gilbert, 1987). In addition, this transformation is routinely used for data that are not normally distributed or where the variance is dependent on the mean (Zar, 1984). Proportional data (TOC and PGS) were processed using an arcsine transformation ($\arcsin\sqrt{x}$) prior to data analysis (Zar, 1984). These transformations were employed when these parameters were used for correlation, regression, and hypothesis testing. In calculating relatively simple descriptive statistics such as mean and standard deviation, the raw data (non-transformed values) were used for all parameters.

Total organic carbon and PGS samples were collected in the field as paired concomitant replicates with the sediment PAH and THC hydrocarbon samples. To evaluate the potential correlation of TOC and PGS with the hydrocarbon data,

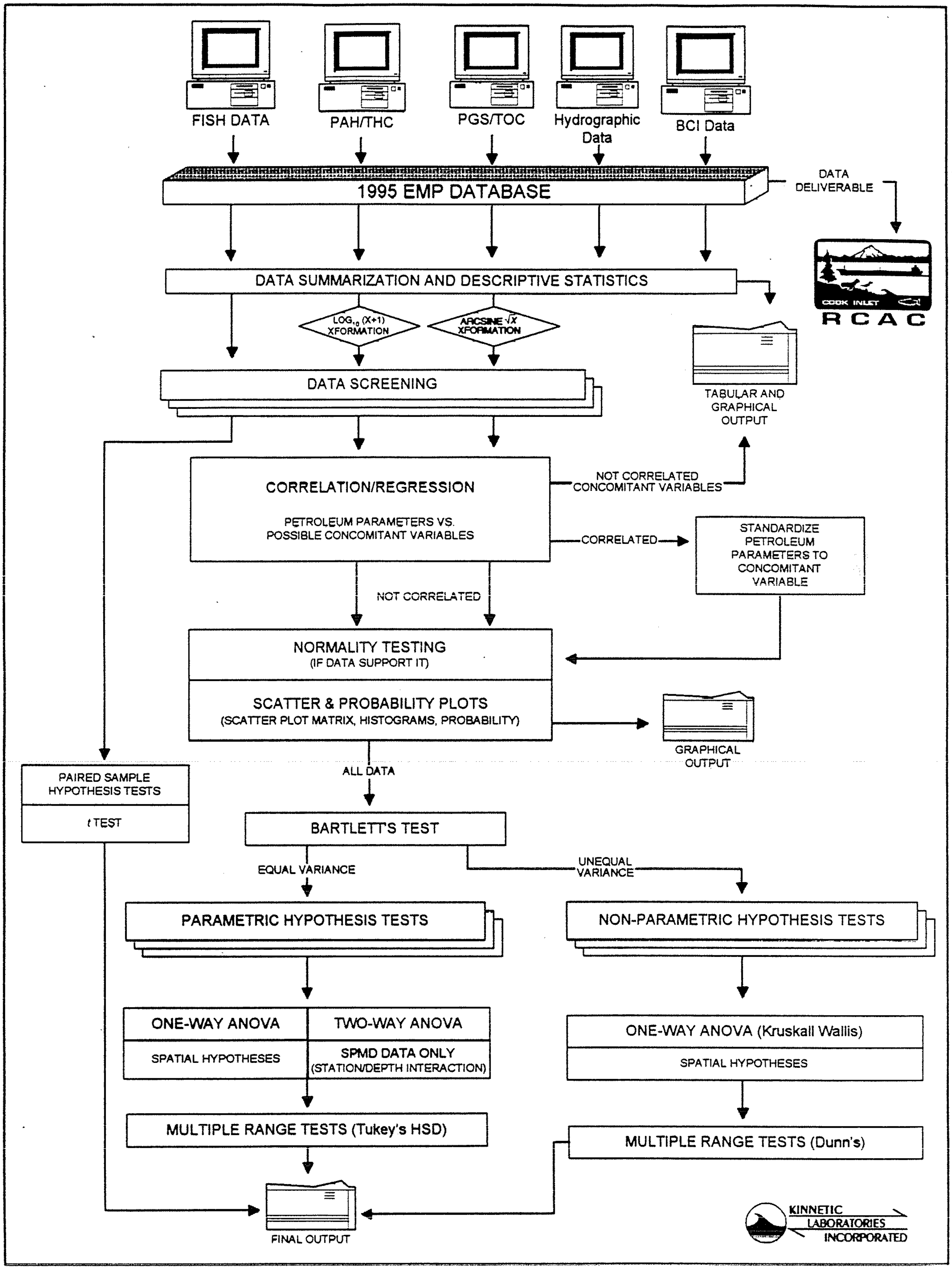



**Figure 3. Data Handling and Statistical Flowchart.**

Pearson's Correlation and Spearman's Rank Correlation Coefficient were computed (Sokal and Rohlf, 1995). In addition, scatter plot matrices which included a best-fit line and 95% confidence limits were used for visual evaluation of these variables' potential effects on the hydrocarbon parameters.

Proper use of parametric testing requires that two basic assumptions be met by the data. The first of these requires that the data set have a normal distribution. This assumption is routinely tested using statistical methods such as the Lilliefor's modification of the Kolmogorov-Smirnov test (Zar, 1984). This statistic, however, is inappropriate for data sets with a small sample size, because it can only detect grossly non-normal data. The use of log transformation, as described above, is often used to ensure that this assumption is met. The second assumption concerns the homogeneity (or homoscedasticity) of the variances of the data. Parametric hypothesis testing is only appropriate for data sets where common variances exist (Sokal and Rohlf, 1995). Bartlett's test for variance homogeneity (Sokal and Rohlf, 1995) was applied to the data to test this second assumption. This test is appropriate for smaller sample sizes and is also quite sensitive to departures from normality. This same method of data screening was used during the pilot program (ADL, 1995a). Parameters that exhibited common variances (known as homogeneity or homoscedasticity) were subject to hypothesis testing using parametric methods. Those which exhibited a lack of common variances (i.e., heteroscedastic) were analyzed using non-parametric methods.

For hypothesis testing, all probability tests assumed an $\alpha = 0.05$ Type I error probability and incorporated a one-way design to address spatial differences among sites. When possible, results from the variance testing, as described above, were used to determine the appropriate statistical test used for each data set, as follows:

- Parametric ANOVA

  One-way parametric ANOVA was performed on appropriate parameters for all stations within a survey. When ANOVA results indicated significant differences between stations, the data were further examined using the Tukey's Honestly Significant Difference (HSD) multiple range test to differentiate between stations based on the station means.

  Two-way parametric ANOVA was performed on SPMD data. This test was appropriate because of the non-replicated sample design of the SPMD moorings and the station/depth interaction. The Tukey's HSD test was used to show the statistical differences between the different cells of the test. Although a non-parametric ANOVA (Friedman's; Zar, 1984) could also have been performed, there is no readily-available multiple range test that could have been used to identify the differences between stations and depths.

- Non-parametric ANOVA

  One-way non-parametric ANOVA was performed on appropriate parameters for all stations within a survey using a Kruskal-Wallis test. Significant results from this test were further evaluated with Dunn's test, which utilizes Wilcoxon rank sums rather than means to determine significant differences between stations.

- Two-sample t-test

  In cases where a paired-sample hypothesis was tested by comparing replicated data from two station, the two-sample (or paired) *t*-test was used. For example, this commonly-used test was appropriate when comparing bile metabolite data collected at each of two stations.

## 3.0 RESULTS AND DISCUSSION

This section presents an overview of the analytical results. Sample collection and analytical data results may be found in the appendices of this report. All hydrocarbon parameters include actual values as well as those that fall below MDLs. That is, results and discussion presented in this report are based on data that have not been censored by removing concentrations below the MDL. As noted in Section 2.3.3, total PAH is the sum of the target PAHs, excluding perylene.

### 3.1 Sediments

#### 3.1.1 Sediment Chemistry and Particle Grain Size

Fifteen sediment replicates were collected during the 1995 EMP for the analysis of sediment chemistry (PAH, THC, and TOC), PGS, and Microtox®. At each of five stations, three discrete replicates were collected.

Particle grain size and TOC were collected as concomitant samples and were evaluated in conjunction with hydrocarbon parameters using correlation and regression. Results of these statistical tests did not show a strong correlation between the parameters, indicating that normalization of hydrocarbon data based on PGS (silt plus clay) or TOC was not strictly necessary. However, because of the *a priori* reason to suspect that these parameters may affect hydrocarbon levels in sediments and because of the small sample size in this study, hypothesis testing was performed both with and without normalization. Results summarized in this section include hypothesis testing on the following:

- Total PAH
- Total PAH normalized to silt plus clay
- Total PAH normalized to TOC
- THC
- THC normalized to silt plus clay
- THC normalized to TOC
- FFPI.

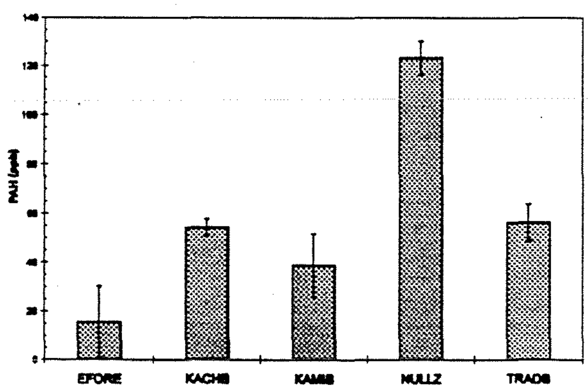


**Figure 4. Mean Sediment Total PAH by Station.**

Total PAH in individual sediment replicates ranged from 5.9 ng/g (parts per billion [ppb]) at EFORE to 129.8 ppb at NULLZ (Table 9). Total PAH values at NULLZ were the highest encountered in the study, with a station mean of 123.3 ppb (Figure 4). It is possible that sediments at the NULLZ station are accumulating hydrocarbons. Individual replicate values at all other stations fell below 64.4 ppb. Ranked by total PAH station means, the five stations were ordered NULLZ, TRADB, KACHB, KAMIB, and EFORE (highest to lowest).

Individual PAH analytes were generally quite low and many were below their MDLs (Appendix B). Most values were below 10 ppb, with only 4 percent of the total falling above this level. Of these, three high values at KACHB were for the analyte of perylene, which is known to be non-petrogenic in nature. Other values greater than 10 ppb were exhibited for the naphthalene homologues ($C_1$Naphthalene, $C_2$Naphthalene, and/or $C_3$Naphthalene), at KAMIB, NULLZ, and TRADB. The NULLZ station also exhibited slightly elevated values (>10 ppb) for the homologues of phenanthrene/anthracene ($C_1$, $C_2$, and/or $C_3$Phenanthrene/Anthracene).

Individual fingerprints of the sediment PAH results indicated a probable combination of hydrocarbon sources. Fairly normal distributions of 2-, 3-, and 4-ring PAHs with the parent at lower concentrations than their alkylated homologues were more obvious at the KAMIB and TRADB stations, and to a lesser extent at the NULLZ, than at KACHB and EFORE (Figure 5). This type of distribution is characteristic of petrogenic input. However, the dibenzothiophene homologues are absent from all stations, indicating that the higher ends of the petrogenic assemblage are lacking. This

**Table 9. Summary of Sediment and Field-Collected Blank Results.**

| Station | Rep. | Sample Number | Date | Time | THC ($\mu$g/g) | Total PAH (ng/g) | FFPI | Sand (%) | Silt & Clay (%) | TOC (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| EFORE-S | 1 | CIR95PTT0010 | 6/23/95 | 11:34 | 4.0 | 32.3 | 82.04 | 63.4 | 36.7 | 0.41 |
| | 2 | CIR95PTT0011 | | 11:51 | 1.9 | 8.8 | 67.61 | 39.4 | 60.7 | 0.22 |
| | 3 | CIR95PTT0012 | | 12:03 | 3.6 | 5.9 | 66.95 | 92.3 | 7.8 | 0.13 |
| KACHB-S | 1 | CIR95PTT0007 | 6/22/95 | 09:09 | 50.8 | 54.4 | 48.99 | 33.5 | 66.4 | 1.59 |
| | 1 | CIR95PTT0007D[a] | | 09:09 | 53.3 | 47.9 | 59.92 | N/A | N/A | 1.50 |
| | 2 | CIR95PTT0008 | | 10:04 | 24.4 | 50.6 | 66.40 | 29.3 | 70.7 | 1.50 |
| | 2 | CIR95PTT0008D[a] | | 10:04 | N/A | N/A | N/A | 30.5 | 69.5 | N/A |
| | 3 | CIR95PTT0009 | | 10:19 | 12.4 | 57.7 | 64.90 | 37.0 | 63.0 | 1.36 |
| KAMIB-S | 1 | CIR95PTT0004 | 6/21/95 | 11:32 | 2.1 | 32.7 | 85.02 | 74.1 | 26.0 | 1.48 |
| | 2 | CIR95PTT0005 | | 11:58 | 4.1 | 53.7 | 90.50 | 74.1 | 25.8 | 0.39 |
| | 3 | CIR95PTT0006 | | 12:12 | 9.4 | 30.1 | 85.88 | 62.7 | 37.4 | 0.35 |
| NULLZ-S | 1 | CIR95PTT0001 | 6/20/95 | 10:23 | 2.2 | 116.1 | 81.70 | 87.8 | 12.2 | 0.43 |
| | 2 | CIR95PTT0002 | | 11:02 | 4.7 | 123.9 | 81.96 | 86.2 | 13.8 | 0.43 |
| | 3 | CIR95PTT0003 | | 11:21 | 7.6 | 129.8 | 86.17 | 84.2 | 15.8 | 0.48 |
| TRADB-S | 1 | CIR95PTT0013 | 6/23/95 | 19:46 | 4.5 | 55.3 | 87.25 | 16.1 | 83.9 | 0.50 |
| | 2 | CIR95PTT0014 | | 19:58 | 2.3 | 49.2 | 87.80 | 21.1 | 78.9 | 0.50 |
| | 3 | CIR95PTT0015 | | 20:09 | 2.5 | 64.4 | 80.67 | 9.4 | 90.6 | 0.53 |
| | 3 | CIR95PTT0015D[a] | | 20:09 | N/A | N/A | N/A | 10 | 90.1 | N/A |
| | FB | CIR95PTB0001 | | 20:29 | <1.0 | 5.1 | 85.29 | N/A | N/A | N/A |
| | FB | CIR95PTB0001D[a] | | 20:29 | <1.0 | 5.2 | 79.81 | N/A | N/A | N/A |
| | EB | CIR95PTB0002 | | 20:21 | <1.0 | 4.7 | 81.71 | N/A | N/A | N/A |
| | EB | CIR95PTB0002D[a] | | 20:21 | <1.0 | 4.1 | 86.17 | N/A | N/A | N/A |

N/A Not Applicable
FB Field Blank
EB Equipment Blank
[a] Lab Duplicate
Sample numbers for Sand and Silt & Clay results have PGS in place of PTT.

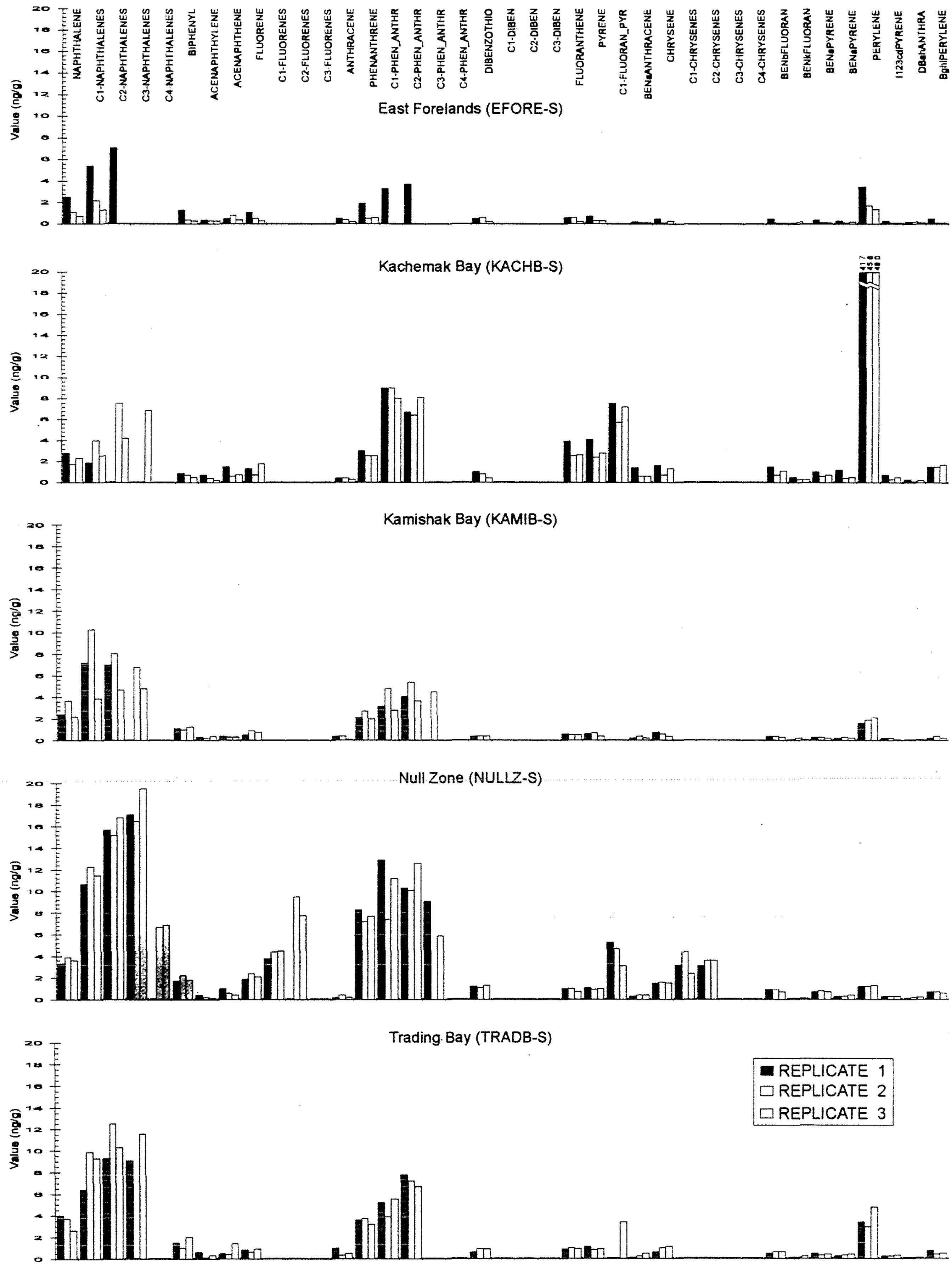



**Figure 5. PAH Fingerprints for the 1995 EMP Sediment Stations.**

is typical of Cook Inlet (Figure 6) and Katalla seep source inputs. In addition, the 4-, 5-, and 6-ring PAHs indicative of pyrogenic inputs (from combustion sources) are present at most stations, although in low concentrations compared to the petrogenic PAHs. These higher molecular weight PAHs are entirely absent at KAMIB. In addition, the alkylated chrysenes are largely absent except at the NULLZ. These analytes are typically associated with diesel fuel as the source. Perylene was present in all samples, ranging from 1.2 ppb (below MDL) at NULLZ to 48 ppb at KACHB.

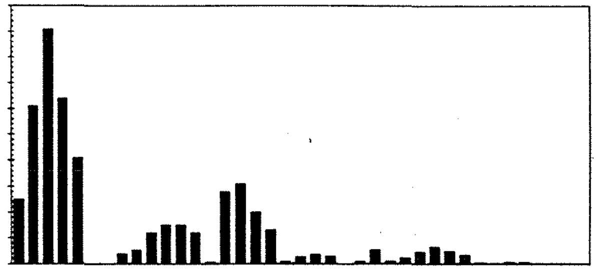


**Figure 6. Fingerprint of Cook Inlet Crude (ADL, 1995b).**

The ratio of certain alkylated PAHs to one another is often used as a diagnostic tool for source identification. This includes such ratios as $C_2$Dibenzothiophene/C Phenanthrene, $C_3$Dibenzothiophene/$C_3$Phenanthrene, $C_2$Chrysene/$C_2$Phenanthrene, and $C_3$Chrysene/$C_3$Phenanthrene. However, because of the absence of many of these PAHs in this sample set, especially the alkyl dibenzothiophenes, use of these ratios is not considered useful here. The alkyl chrysenes were also largely lacking from the data set.

Results of the one-way non-parametric ANOVA performed on log transformed total PAH results indicated significant differences between stations at the $\alpha$=0.05 level ($\rho$=0.020; Table 10). Multiple range testing (Dunn's) indicated that NULLZ, which showed the highest total PAH concentration, was significantly different from EFORE, which had the lowest concentrations. The fact that the NULLZ samples exhibited elevated hydrocarbon levels may indicate that these compounds are accumulating at this location. Non-parametric ANOVA of total PAH normalized to silt plus clay showed significant differences between stations ($\rho$=0.029). Dunn's test results of this parameter showed that NULLZ, which exhibited the highest total PAH and the lowest silt plus clay in terms of station means, was significantly different from TRADB, which had the highest silt plus clay values. It is questionable whether this significance is meaningful, however, because high PAHs are typically associated with higher silt plus clay values as the PAHs more readily adsorb onto finer particles. When normalized to TOC, total PAH also showed significant differences between stations when tested non-parametrically ($\rho$=0.034). Multiple range testing indicated that the NULLZ and KACHB stations were significantly different from one another.

Individual replicate THC ranged from 1.9 $\mu$g/g (parts per million [ppm]) at EFORE to 53.3 ppm at KACHB (Table 9). Station means ranged from 3.1 ppm at TRADB to 29.2 ppm at KACHB (Figure 7). The elevated levels of THC at KACHB compared to all other stations is not suprising considering the large amount of perylene seen at this station. Parametric one-way ANOVA of log transformed THC indicated a significant difference between stations ($\rho$=0.005), and the Tukey's HSD test indicated that KACHB was significantly different from all other stations. Differences between stations were not significant when THC levels were normalized to either silt plus clay or TOC ($\rho$=0.154 and 0.554, respectively). This showed that, although correlation and regression analyses did not indicate a relationship between these parameters and THC levels, they may in actuality have an effect on THC.

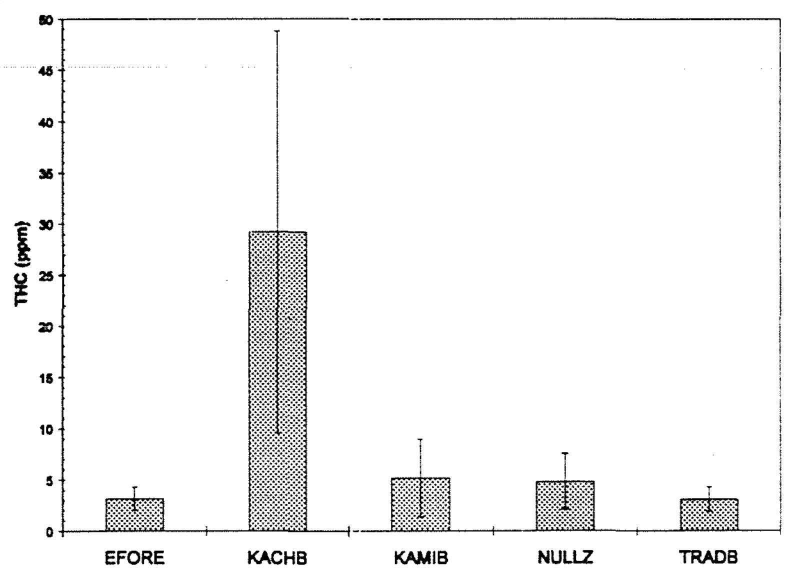



**Figure 7. Mean Sediment THC by Station.**

**Table 10.** **Results of One-Way ANOVA Hypothesis Testing on EMP Sediment Stations.** Bold probability (ρ) values represent significance at the predetermined level ($\alpha$=0.05) for Type I errors. Stations joined by solid line were not significantly different in Tukey's or Dunn's multiple comparison. Values in parentheses are untransformed station means (n=3). Values are reported in parts per billion (ng/g ) dry weight for PAH and $\mu$g/g for THC.

| VARIABLE [a] | ANOVA [b] | PROBABILITY (ρ) | STATION [c] LOW | | | | HIGH |
|---|---|---|---|---|---|---|---|
| Total PAH | NP | **0.020** | (15.7) EFORE | (38.8) KAMIB | (54.2) KACHB | (56.3) TRADB | (123.3) NULLZ |
| Total PAH (Normalized to Silt+Clay) | NP | **0.029** | (0.7) TRADB | (0.6) EFORE | (0.8) KACHB | (1.4) KAMIB | (8.9) NULLZ |
| Total PAH (Normalized to TOC) | NP | **0.034** | (36.8) KACHB | (54.7) EFORE | (81.9) KAMIB | (110.2) TRADB | (276.2) NULLZ |
| THC | P | **0.005** | (3.1) TRADB | (3.2) EFORE | (4.8) NULLZ | (5.2) KAMIB | (29.2) KACHB |
| THC (Normalized to Silt+Clay) | P | 0.154 | (0.04) TRADB | (0.16) KAMIB | (0.20) EFORE | (0.33) NULLZ | (0.44) KACHB |
| THC (Normalized to TOC) | P | 0.554 | (6.1) TRADB | (12.9) KAMIB | (10.6) NULLZ | (15.4) EFORE | (19.1) KACHB |
| FFPI | P | **0.002** | (60.1) KACHB | (72.2) EFORE | (83.3) NULLZ | (85.2) TRADB | (89.4) KAMIB |

*a* PAH and THC values were log transformed [$Log_{10}(X+1)$] prior to running hypothesis tests.

*b* NP = Non-parametric One-Way ANOVA (Kruskal-Wallis)
P = Parametric One-Way ANOVA
Variables failing Bartlett's test for homogeneity were run non-parametrically

*c* Stations are ranked from lowest to highest mean value for parametric tests and by Wilcoxon rank sums for non-parametric tests. (Wilcoxon scores not included in table).

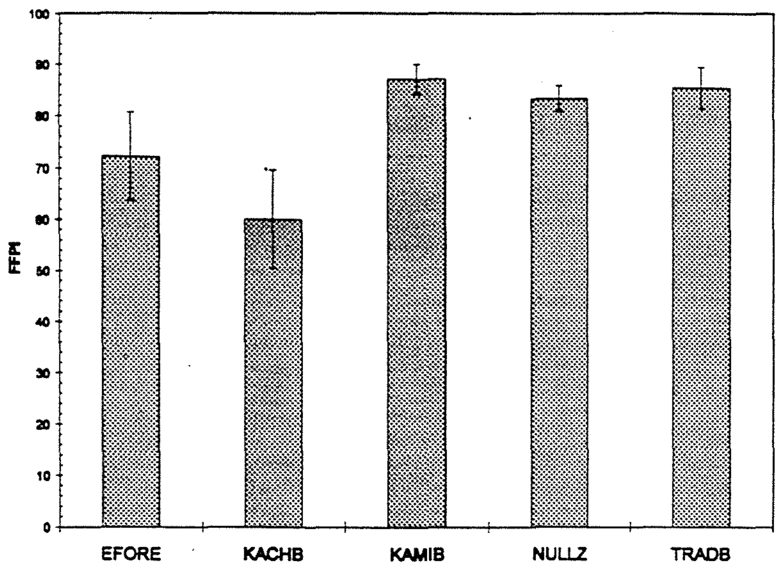



**Figure 8. Mean Sediment FFPI by Station.**

Individual FFPI ratios computed for all replicates ranged from 49.0 to 90.5 with station means ranging from 60.1 (KACHB) to 87.1 (KAMIB). As noted in Section 2.3.3, FFPI ratios close to 100 indicate petrogenic hydrocarbons, while a ratio near 0 indicates pyrogenic and diagenic sources (Boehm and Farrington, 1984). As expected from the fingerprints, KAMIB and TRADB hydrocarbons appear to be the result of petrogenic inputs with mean FFPIs of 87.1 and 85.2, respectively (Figure 8). The NULLZ station showed a mean of 83.3 for FFPI. Lower FFPI ratios were encountered at EFORE (72.2) and KACHB (60.1). Hydrocarbons at all stations tended to be more petrogenic than pyrogenic in nature based on FFPI values, which is substantiated by the lower relative levels of the higher molecular weight PAHs. Parametric one-way ANOVA indicated that significant differences existed for FFPI between stations (ρ=0.002). Tukey's HSD indicated that KAMIB, TRADB, and NULLZ were significantly different as a group from KACHB.

Percent silt plus clay station means ranged from 13.9 at NULLZ, a very sandy station, to 84.5 at TRADB (Figure 9). On the basis of both means and medians, stations were ranked from high to low as TRADB, KACHB, EFORE, KAMIB, and NULLZ. Percent TOC station means ranged from 0.25 at EFORE to 1.48 at KACHB, with individual values ranging from 0.13 to 1.59 with the same stations at the extremes.

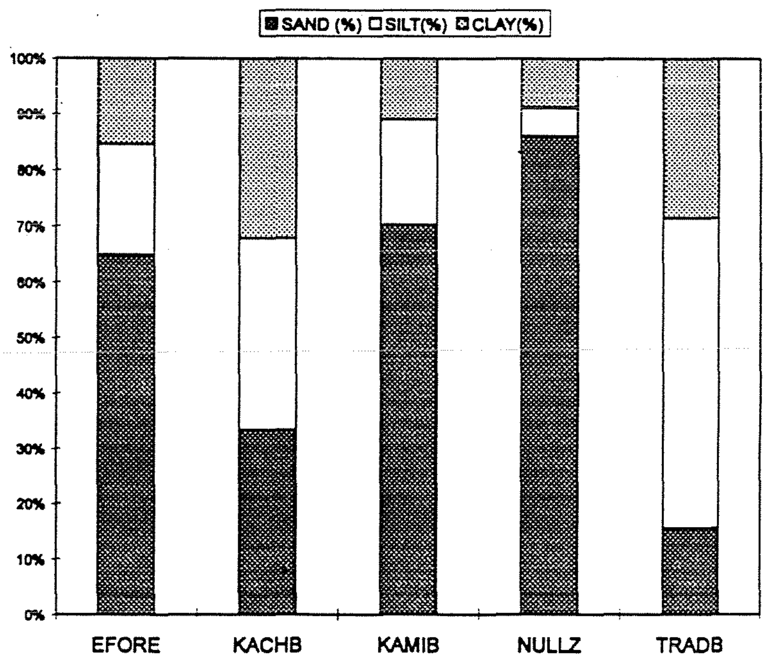



**Figure 9. Mean PGS by Station.**

Results of the analyses performed to provide an evaluation of extraction efficiency are provided in Table 11. Three samples collected during the pilot program in 1994 were provided to GERG for analysis, and extractions were performed using two different methods as described in Section 2.2.2. In all three samples, soxhlet extraction resulted in higher extraction efficiency (based on higher total PAH values) than the sonication procedure performed by GERG. As anticipated, the sonication extraction performed by GERG apparently failed to extract some of the more highly-alkylated homologues, particularly the naphthalene and fluorene series. This is why the more efficient soxhlet extraction procedure was proposed by GERG at the beginning of the 1995 EMP. All three samples subject to sonication at GERG showed lower total PAH than those extracted by sonication at ADL (electronic data provided by CIRCAC). Without more closely examining each laboratory's sonication procedures, and possibly analyzing more samples, it is impossible to determine why sonication extraction efficiencies differ so much between the two laboratories.

When comparing ADL's sonication procedure results with 1995 soxhlet extraction analyses of splits of the same samples at GERG, the total PAH results seem comparable. Two of the soxhlet procedure samples analyzed at GERG resulted in higher total PAH (113.8 and 117.3 ppb) as compared to ADL results (92.8 and 113.5 ppb). One sample, from Trading Bay, showed a lower total PAH for GERG's soxhlet procedure (110.4 ppb) as compared to ADL's sonication (114.9 ppb).

Table 11. Comparison of Total PAH Results from Different Extraction Procedures.

| Sample | GERG Sonication Total PAH (ng/g) | GERG Soxhlet Total PAH (ng/g) | ADL Sonication Total PAH (ng/g) | Average RPD for All Analytes (GERG Soxhlet/ADL Sonication) |
|---|---|---|---|---|
| Trading Bay (RCAC940500OR) | 89.0 | 117.3 | 113.5 | 7.0 |
| Trading Bay (RCAC940600OR) | 74.5 | 110.4 | 114.9 | 9.8 |
| East Forelands (RCAC941700OR) | 88.1 | 113.8 | 92.8 | 20.3 |

The differences in reported total PAH concentrations by the two different extraction methods are minimal, particularly since analyses were run on sample splits. In fact, average relative percent differences (RPDs) comparing the two laboratories' results were 7.0, 9.8, and 20.3, well within the expected range for sample splits. In addition, the fingerprints of GERG's soxhlet extraction results and ADL's sonication results are comparable, particularly with respect to the more alkylated homologues (Figure 10).

Laboratory quality control objectives for PAH sediment and water blank analyses were met as specified in the SOPs, with any individual data points failing to meet specific criteria appropriately qualified as described in Section 2.2.11. Procedural blank values all fell below three times the MDL. Total PAH in field-collected water blanks was low, ranging from 4.1 to 5.2 ppb, also less than three times the MDL. Surrogate recoveries for samples and QC samples fell within acceptance criteria of 40 to 120 percent. Matrix spike/matrix spike duplicate average recovery of all analytes fell between 40 and 120 percent. Check standards and SRMs (NIST 1941) results were within expected laboratory performance standards.

Quality control objectives for TOC were met as specified in the SOP. The procedural blank showed a TOC concentration of less than three times the MDL. One sample in the TOC batch was duplicated, and duplicate values were within 20 percent. Analysis of an NIST SRM (1941) fell within the acceptance range for the laboratory.

### 3.1.2 Microtox® Testing

Microtox® testing indicated no toxicity in any of the sediments sampled (Appendix B). For each sample, the maximum amount of sediment that could be tested following this procedure (1.63 mg of sediment/mL of extract) failed to produce sufficient light inhibition to allow the calculation of an $EC_{50}$ value. Due to the lack of toxicity demonstrated by samples collected during the first survey (Tier 1), no further toxicity testing was performed. Quality control performed in conjunction with toxicity testing included an extraction blank which exhibited negative or low gamma readings, indicating no toxicity. In addition, six phenol reference toxicant assays were performed. The $EC_{50}$ for phenol ranged from 20.36 to 24.71 mg/L, well within the expected range of 13 to 26 mg/L. Mean $EC_{50}$ for phenol was 22.38 ±1.73 mg/L.

## 3.2 Semi-Permeable Polymeric Membrane Devices

Moorings supporting surface and bottom SPMDs were deployed at three stations: EFORE, KACHB, and TRADB. Individual SPMD results can be found in Appendix C. Exposure time of the moorings ranged from approximately 32 to 35 days (Table 12). The SPMDs accumulated varying levels of PAHs, with TRADB showing the highest total PAH

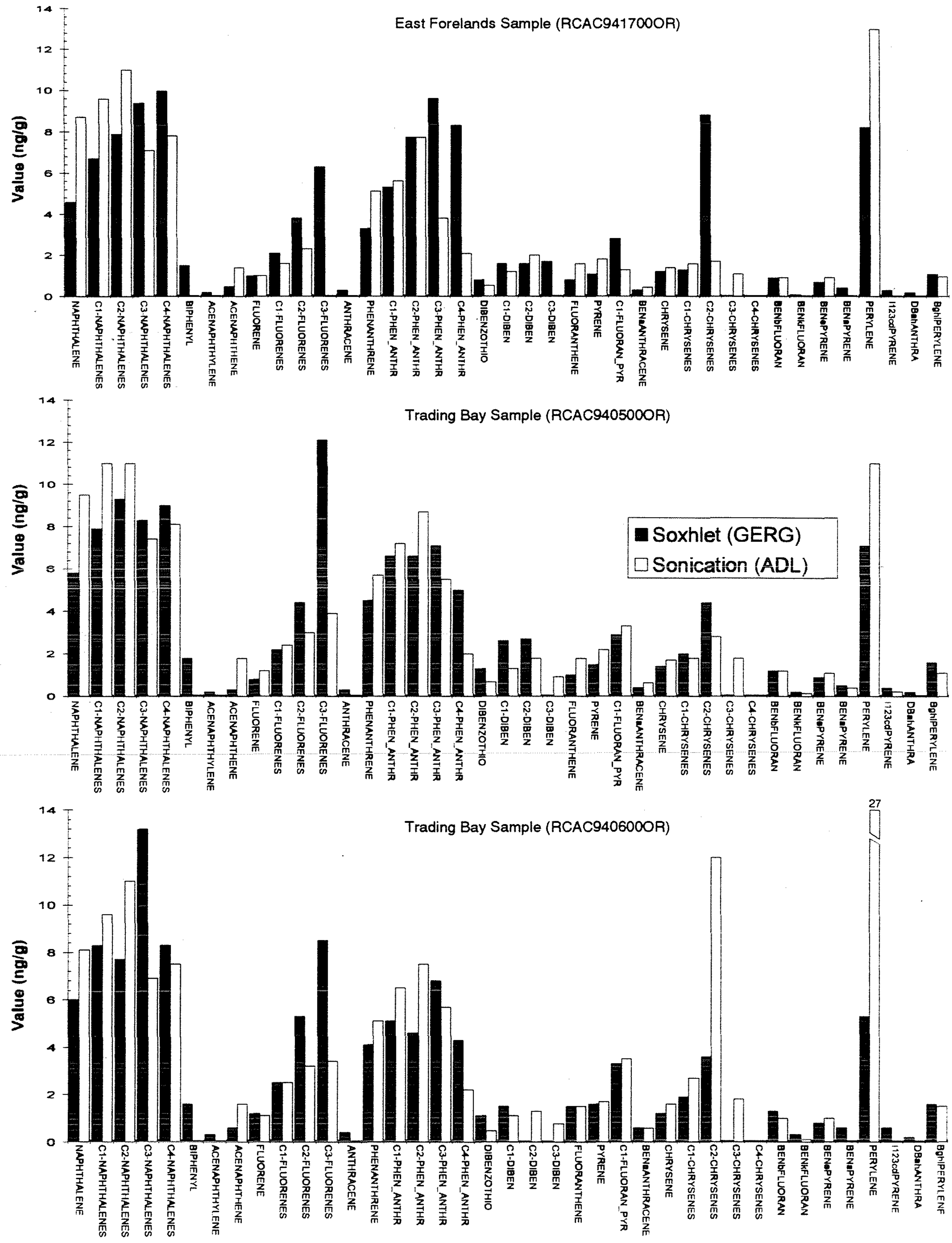



**Figure 10. PAH Fingerprints from Interlaboratory Soxhlet and Sonication Extraction Evaluation.**

Table 12. Summary of Semi-Permeable Polymeric Membrane Device (SPMD) Results with Associated Hydrographic Data.

| Station | Sample Number | Action | Date | Time | Exposure Time | Total PAH (ng/SPMD) | THC (mg/SPMD) | FFPI | Temp. (°C) | Salinity (‰) | DO (mg/L) | pH (units) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EFORE-M (FB) | CIR95SPM0003 | DEPLOY | N/A | N/A | 10 MIN | 2,403.8 | 0.37 | N/A | N/A | N/A | N/A | N/A |
| | | RETRIEVE | N/A | N/A | 13 MIN | | | | N/A | N/A | N/A | N/A |
| EFORE-M (SFC) | CIR95SPM0004 | DEPLOY | 6/24/95 | 01:33 | 31.9 DAYS | 4,605.6 | 0.65 | 89.0 | 10.6 | 23.0 | 9.6 | 7.9 |
| | | RETRIEVE | 7/25/95 | 23:20 | | | | | 13.7 | 20.1 | 8.5 | 8.0 |
| EFORE-M (BOT) | CIR95SPM0005 | DEPLOY | 6/24/95 | 01:32 | 31.9 DAYS | 6,494.7 | 0.47 | 94.0 | 10.6 | 23.0 | 9.6 | 7.9 |
| | | RETRIEVE | 7/25/95 | 23:20 | | | | | 13.4 | 20.5 | 8.6 | 8.0 |
| KACHB-M (FB) | CIR95SPM0001 | DEPLOY | N/A | N/A | 8 MIN | 2,513.9 | 0.20 | N/A | N/A | N/A | N/A | N/A |
| | | RETRIEVE | N/A | N/A | 6 MIN | | | | N/A | N/A | N/A | N/A |
| KACHB-M (SFC) | CIR95SPM0008 | DEPLOY | 6/22/95 | 14:36 | 34.8 DAYS | 5,545.4 | 0.54 | 88.7 | 7.8 | 30.6 | 11.1 | 8.2 |
| | | RETRIEVE | 7/27/95 | 09:15 | | | | | 9.8 | 28.1 | 9.5 | 8.1 |
| KACHB-M (BOT) | CIR95SPM0009 | DEPLOY | 6/22/95 | 14:34 | 34.8 DAYS | 7,635.9 | 0.37 | 91.3 | 6.2 | 31.3 | 10.0 | 8.1 |
| | | RETRIEVE | 7/27/95 | 09:39 | | | | | 8.8 | 30.0 | 9.4 | 8.1 |
| TRADB-M (FB) | CIR95SPM0002 | DEPLOY | N/A | N/A | 11 MIN | 2,443.4 | 0.36 | N/A | N/A | N/A | N/A | N/A |
| | | RETRIEVE | N/A | N/A | 12 MIN | | | | N/A | N/A | N/A | N/A |
| TRADB-M (SFC) | CIR95SPM0006 | DEPLOY | 6/23/95 | 23:31 | 32.5 DAYS | 11,949.6 | 0.63 | 94.2 | 9.3 | 23.1 | 10.0 | 7.9 |
| | | RETRIEVE | 7/26/95 | 11:45 | | | | | 12.3 | 21.0 | 9.3 | 7.9 |
| TRADB-M (BOT) | CIR95SPM0007 | DEPLOY | 6/23/95 | 23:30 | 32.5 DAYS | 16,458.9 | 0.54 | 94.5 | 9.0 | 24.5 | 10.0 | 8.0 |
| | | RETRIEVE | 7/26/95 | 11:46 | | | | | 12.3 | 21.1 | 9.3 | 7.9 |

FB Field Blank
SFC 2.5 Meters Below Water Surface
BOT 2.5 Meters Above Bottom
N/A Not Applicable

concentrations followed by KACHB and EFORE (Figure 11). During the 1994 program, the highest SPMD PAH concentrations were also seen at the TRADB site. Total PAH concentrations at TRADB were 11,950 and 16,459 ng/SPMD for the top and bottom SPMDs, respectively. At each station, the bottom SPMD accumulated more PAHs than the surface SPMD. As shown in Figure 12, the distribution of PAHs found at the bottom of each mooring accounted for about 58 percent of the whole.

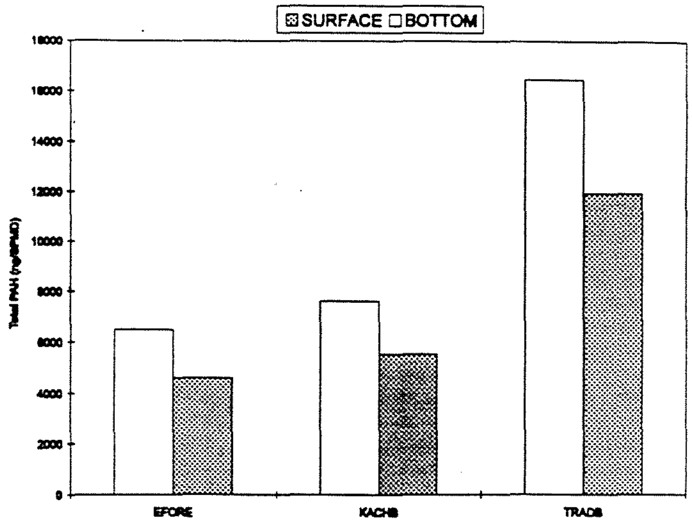


**Figure 11. Total PAH in SPMDs.**

The PAH fingerprints exhibited a number of interesting features. Relatively high levels of naphthalene and alkyl naphthalenes were seen in all samples including the field blanks, which probably indicates air contamination rather than actual accumulation of naphthalenes in the water column (Figure 13). High levels of the naphthalenes were also seen in the two laboratory blanks which may indicate contamination in the preparation, extraction, or processing of the SPMDs in the laboratory rather than a field methodology problem (refer to Appendix C). However, even taking methodology problems into account, naphthalenes at TRADB were considerably elevated as compared to all other samples. There were also relatively high levels of the alkyl fluorene analytes in a number of samples, with the highest concentrations of alkyl fluorenes in the bottom SPMDs at all three mooring sites. Much lower concentrations were seen in the near surface and field blank samples. Relatively high levels of the alkyl fluorenes, however, were also seen in one of the two laboratory method blanks, which may indicate a problem with SPMD preparation, storage, or analytical methodology. The ratio of dibenzothiophenes to phenanthrenes was similar for EFORE and KACHB, whereas the TRADB site had much higher concentrations of phenanthrenes relative to the dibenzothiophenes, which is typical of Cook Inlet crude oil. Visual comparison of the fingerprints in Figures 6 and 13 also indicates similaries between Cook Inlet crude oil and the TRADB SPMD results. However, source identification of the hydrocarbons in the TRADB SPMD is difficult because of the methodology problems as discussed above and the fact that chrysene concentrations were lower than expected in the SPMDs.

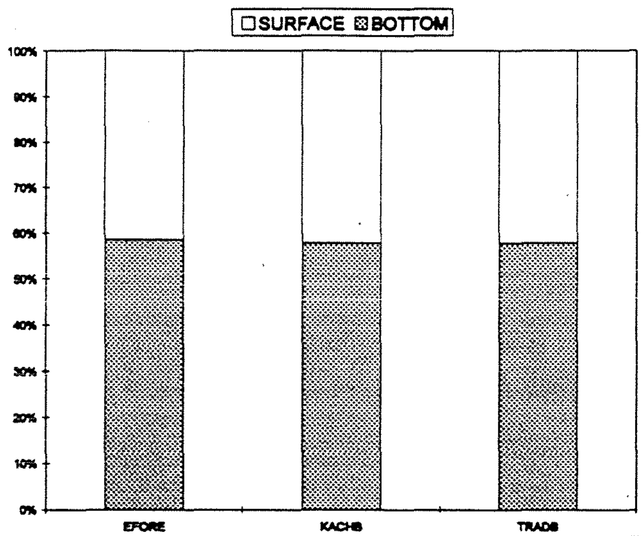
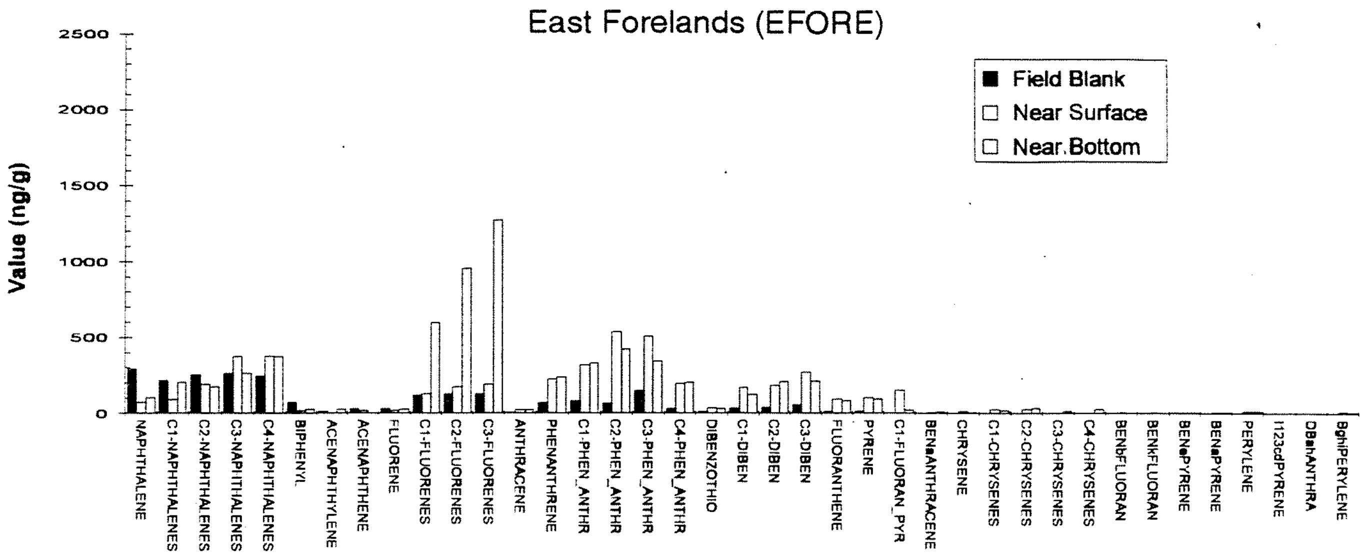
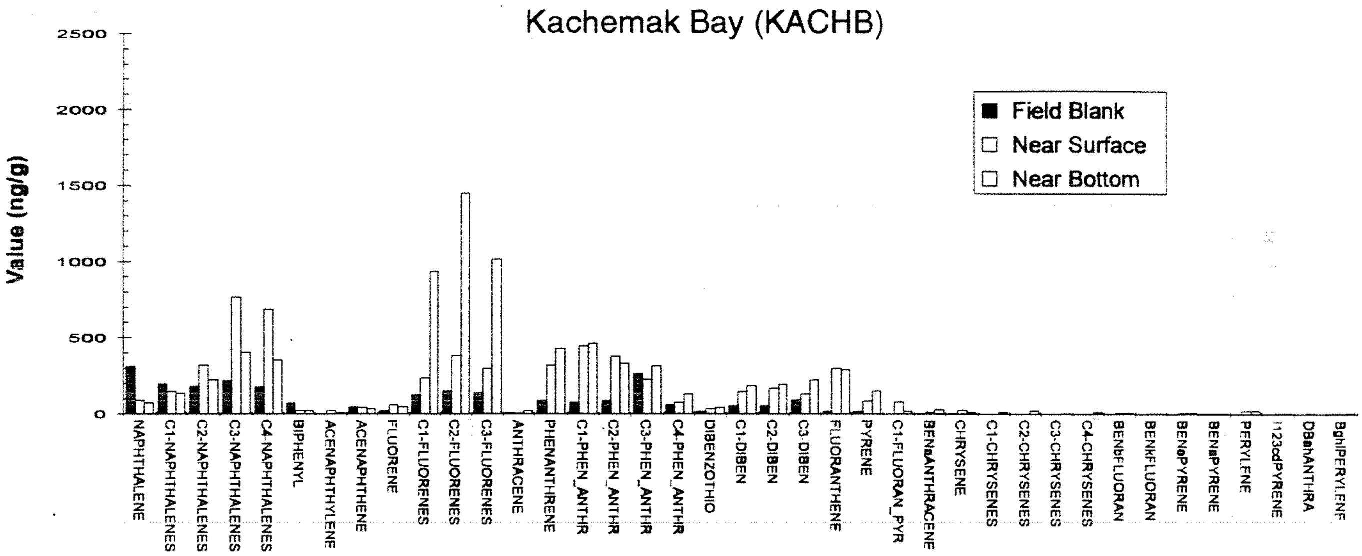


**Figure 12. Distribution of PAH with Depth in SPMDs.**

At TRADB, the surface and bottom fingerprints were similar with slightly higher PAH concentrations at the bottom (Figure 13). Except for the fluorenes, it appears that the same suite of hydrocarbons was sampled by the top and bottom SPMDs at EFORE and KACHB, with similar abundances of individual PAH analytes. It is inferred that in general, more hydrocarbons were available for accumulation at the bottom locations, closer to the sediment-water interface where the bulk of sediment resuspension and sediment transport occurs.

Results of the two-way parametric ANOVA performed on the SPMD data indicated significant differences between stations ($\rho$=0.0002) and depths ($\rho$=0.0006) for log transformed total PAH (Table 13). Results of the Tukey's HSD test indicated that each station was significantly different than the others when looked at in terms of the station mean (mean total PAH of the top and bottom SPMDs). In terms of depth, the top and bottom SPMDs (averaged across stations) were also shown to be significantly different by the Tukey's HSD test. However, the two-way ANOVA also indicated a significant interaction ($\rho$=0.0002) of station and depth. This lack of independence between the two test factors makes interpretation unreliable.



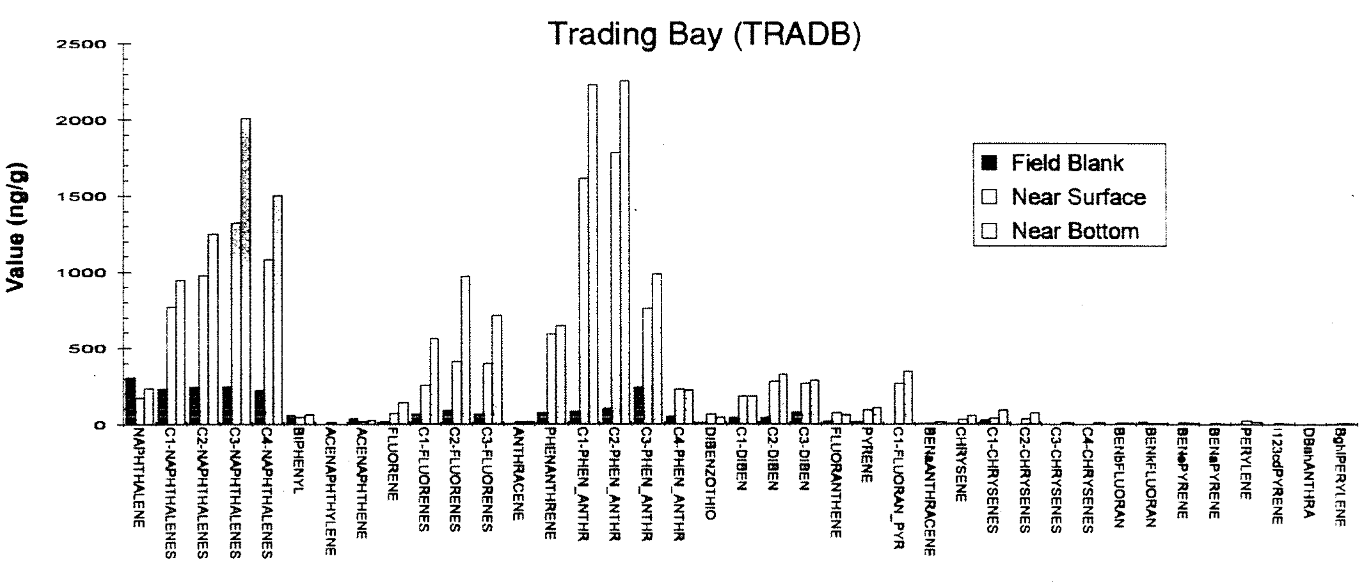




**Figure 13. PAH Fingerprints for SPMDs at East Forelands, Kachemak Bay, and Trading Bay.**

**Table 13.** **Results of Two-Way ANOVA Hypothesis Testing on SPMD Mooring Stations.** Bold probability (ρ) values represent significance at the predetermined level (α=0.05) for Type I errors. Stations or depths joined by solid line were not significantly different in Tukey's multiple comparison. Values in parentheses are untransformed means in (n=3 for station, and n=2 for depth).

| VARIABLE [a] | STATION PROBABILITY | STATION LOW | STATION | STATION HIGH | DEPTH PROBABILITY | DEPTH LOW | DEPTH HIGH | STN•DEPTH PROBABILITY |
|---|---|---|---|---|---|---|---|---|
| Total PAH [b] | **0.0002** | (5,550) EFORE | (6,590) KACHB | (14,204) TRADB | **0.0006** | (7,366) SFC | (10,196) BOT | **0.0002** |
| THC [b] | 0.122 | (0.46) KACHB | (0.56) EFORE | (0.59) TRADB | **0.040** | (0.46) BOT | (0.61) SFC | 0.074 |
| FFPI | 0.225 | (90.00) KACHB | (91.48) EFORE | (94.34) TRADB | 0.195 | (90.63) SFC | (93.25) BOT | 0.229 |

*a* PAH and THC values were log transformed [$Log_{10}(X+1)$] prior to running hypothesis tests.

*b* Values in parentheses show results for PAH (ng/SPMD) and THC (mg/SPMD).

Concentrations of THC found in surface SPMDs at all three stations were higher than those in bottom SPMDs (Table 12). The surface THC at EFORE was 0.65 mg/SPMD, slightly higher than that at TRADB (0.63 mg/SPMD) and KACHB (0.54 mg/SPMD). Bottom THC levels ranged from 0.37 mg/SPMD at KACHB to 0.54 mg/SPMD at TRADB.

Concentrations of THC in the field blanks ranged from 0.2 to 0.37 mg/SPMD. The analysis of THC in SPMDs is confounded by the lipid material that concentrates the organics in the SPMDs which makes interpretation of THC data unreliable. In general, however, there appeared to be a trend of the least amount of THC in the field blanks, followed by greater concentrations in the bottom samples, and the highest concentrations at the surface.

Results of a parametric two-way ANOVA performed on log transformed THC data did not indicate a significant difference between stations, but did show a significant difference between depths (ρ=0.040; Table 13). Surface SPMDs had significantly higher THC concentrations than those at the bottom. The test results for the interaction term was non-significant (ρ=0.074).

The calculated FFPIs for SPMDs were high and ranged from 88.7 at KACHB surface to 94.5 at TRADB bottom. This seems to be in agreement with the petrogenic signatures exhibited by the SPMD samples. However, as noted in Section 2.3.3, use of FFPI as a source identifier of hydrocarbons in SPMDs is likely confounded by preferential uptake of hydrocarbons and other factors that may influence the individual PAH concentrations, such as membrane permeability. Results of a parametric two-way ANOVA failed to show significant differences in FFPI between stations or depths (Table 13).

Quality control samples for the SPMDs consisted of field blanks, laboratory blanks, and solvent blanks as described in Sections 2.1.2 and 2.2.11. Results of total PAH from the field blanks were all substantially lower than their associated samples and were, in general, less than half of the sample value. With the exception of naphthalenes, individual PAH analytes were also lower in the field blanks than in their associated field samples. Naphthalene and $C_1$ and $C_2$-naphthalene values were as high or higher in the field blanks than in the field samples. This probably reflects differences in exposures of the blank and field samples, the high solubility of naphthalene, and the greater likelihood of air contamination from these extremely volatile compounds. The low field blank values demonstrated that field methods were for the most part successful in minimizing hydrocarbon exposure to the SPMDs during the deployment and retrieval process. Reducing field contamination was of primary importance given the problems encountered during the pilot program. The total PAH field blank values from all three stations were very similar indicating that possible exposure due to field sampling was the same for each site. Comparisons of these field blanks to the laboratory blanks also indicates that field exposure was very low. Of the two laboratory blanks that were run, total PAH for one was slightly higher than the associated field blanks and one was substantially lower. One of the laboratory blanks was considered to be anomalously high due to a probable storage problem in the laboratory. This blank showed high levels of alkyl fluorenes, which accounted for almost half of the total PAHs. These potentially elevated levels of alkyl fluorenes were also noted on two of the bottom SPMDs (at EFORE and KACHB) and may indicate a problem with the methodology.

The laboratory QC for the PAH analysis of the SPMDs were all within the specified limits with the following exceptions. A matrix interference was encountered with the surrogate $d_{10}$-Phenanthrene where an unidentified compound co-eluted with the analyte and precluded using this surrogate for quantification. The surrogate $d_{10}$-Acenaphthene was substituted for quantifying the analytes normally covered by $d_{10}$-Phenanthrene. In addition, the surrogate $d_{12}$-Perylene was outside the internal QC limits for several samples and was qualified as such in the results. These QC variances did not affect the overall quality of the data set.

## 3.3 Bioaccumulation in Fish

A summary of trawl catch data collected during the first survey is provided in Table 14 and Appendix D. Although trawling was attempted at all sites, it was reasonably successful only at KACHB and KAMIB. It had been anticipated that it would be difficult, if not impossible, to select a target species that was available at all study locations, and results of the trawling indicated that this was correct. During survey two, long-lining and rod and reel fishing methods were used to collect Pacific halibut, *Hippoglossus stenolepis*, from these two sites. Although these fishing methods were also attempted at some of the other locations, the fishing was successful only at KACHB and KAMIB.

Seven fish from each of the two sites were sampled for bile metabolites and cytochrome P4501A. In addition, length, weight, anomalies, and gender (where possible) were recorded for each specimen. Halibut length ranged from 50 to 100 cm at KACHB with a mean of 72 cm; lengths at KAMIB were comparable, ranging from 60 to 90 cm with a mean of 77 cm. Halibut weight ranged from 1.4 to 13.8 kg at KACHB, with a mean of 5.8 kg, and from 2.4 to 9.8 kg at KAMIB, with a mean of 5.4 kg. Most fish remained unidentified in terms of gender. Two-sample *t*-tests of both length and weight data did not show significant differences between stations.

### 3.3.1 Bile Metabolites

Bile metabolites in Pacific halibut collected at both stations were low or below detection limits. Naphthalene levels in fish from KACHB ranged from 7,000 to 24,000 ppb (wet weight), with a station average of 13,100 ppb (Table 15). Fish collected at KAMIB showed naphthalene levels which ranged from 7,600 to 14,000 ppb, with a station mean of 10,100 ppb. Phenanthrenes were lower, ranging from 1,100 to 6,600 ppb at KACHB and from 990 to 2,700 ppb at KAMIB. Station means for phenanthrene were 2,500 and 1,530 ppb for KACHB and KAMIB, respectively. Benzo(a)pyrene levels for all samples were below MDL (<100 ng/g wet weight). Results of a two-sample *t*-test performed on log transformed data showed no significant difference ($\alpha$=0.05) between the two stations tested in terms of either naphthalene ($\rho$=0.319) or phenanthrene ($\rho$=0.253). All of the fish sampled exhibited low levels of bile metabolites, indicating exposure to hydrocarbons was low.

Quality control for bile metabolites included the analyses of reference bile that were compared to laboratory control charts to verify instrument performance. Reference bile analyses performed in conjunction with this study fell within acceptable ranges. In addition, three procedural blanks performed with the bile metabolite analyses all fell below MDLs. Duplicate analyses performed for three biliary samples, all showing good agreement with their respective samples, are shown in Table 15.

## Table 14. Fish Trawl Data.

| Station | Trawl No. | Date | Time | Common Name | Taxon | Total # Fish | Comments |
|---|---|---|---|---|---|---|---|
| KAMIB-T | 1b[a] | 6/20/95 | 20:21 | Armorhead Sculpin | *Gymnocanthus galeatus* | 4 | |
| | | | | Fantail Sole | *Xystreurys liolepis* | 3 | |
| | | | | Pacific Cod | *Gadus macrocephalus* | 4 | |
| | | | | Pacific Halibut | *Hippoglossus stenolepis* | 11 | |
| | | | | Pacific Spiny Lumpsucker | *Eumicrotremus orbis* | 1 | |
| | | | | Ribbed Sculpin | *Triglops pingeli* | 6 | |
| | | | | Rock Sole | *Pleuronectes bilineatus* | 8 | many parasites |
| | | | | Threaded Sculpin | *Gymnocanthus pistilliger* | 37 | |
| | | | | Whitespotted Greenling | *Hexagrammos stelleri* | 3 | |
| | | | | Yellow Irish Lord | *Hemilepidotus jordani* | 4 | |
| | 2 | 6/20/95 | 21:16 | Armorhead Sculpin | *Gymnocanthus galeatus* | 13 | |
| | | | | Fantail Sole | *Xystreurys liolepis* | 3 | |
| | | | | Pacific Cod | *Gadus macrocephalus* | 6 | |
| | | | | Pacific Halibut | *Hippoglossus stenolepis* | 17 | |
| | | | | Red Irish Lord | *Hemilepidotus hemilepidotus* | 2 | |
| | | | | Ribbed Sculpin | *Triglops pingeli* | 3 | |
| | | | | Rock Sole | *Pleuronectes bilineatus* | 16 | |
| | | | | Whitespotted Greenling | *Hexagrammos stelleri* | 6 | |
| | 3b[b] | 6/20/95 | 22:17 | Armorhead Sculpin | *Gymnocanthus galeatus* | 3 | |
| | | | | Rock Sole | *Pleuronectes bilineatus* | 7 | |
| KACHB-T | 1 | 6/22/95 | 11:06 | Alaskan Plaice | *Pleuronectes quadrituberculatus* | 1 | |
| | | | | Flathead Sole | *Hippoglossoides elassodon* | 3 | |
| | | | | Rock Sole | *Pleuronectes bilineatus* | 2 | |
| | 2 | 6/22/95 | 11:41 | Rock Sole | *Pleuronectes bilineatus* | 2 | |
| | 3 | 6/22/95 | 12:02 | Armorhead Sculpin | *Gymnocanthus galeatus* | 1 | |
| | | | | Fantail Sole | *Xystreurys liolepis* | 2 | |
| | | | | Flathead Sole | *Hippoglossoides elassodon* | 2 | |
| EFORE-T | 3 | 6/23/95 | 13:22 | Hooligan | *Thaleichthys pacificus* | 1 | No fish in trawls 1 or 2 |
| TRADB-T | 1 | 6/23/95 | 20:48 | Hooligan | *Thaleichthys pacificus* | 2 | |
| | 2 | 6/23/95 | 21:07 | Wattled Eelpout | *Lycodes palearis* | 1 | No fish in trawl 3 |

[a] Trawl 1a empty except for some jellyfish.
[b] Trawl 3a hung up on rocky area. Trawl 3b lost some of catch due to torn mesh upon retrieval.
Two attempts were made to trawl at Southeast Kamishak Bay. Trawling was discontinued due to rocky bottom.

## Table 15. Results of Bile Metabolite and Liver Enzyme Induction Analyses on Pacific Halibut (*Hippoglossus stenolepis*).

| Station | Sample Number | Date | Time | Length (cm) | Weight (kg) | Gender | Naphthalene (ng/g) wet weight | Phenanthrene (ng/g) wet weight | Benzo(a)pyrene (ng/g) wet weight | GERG Protein (mg) | NMFS Protein (mg) | GERG EROD 25°C (pmol/min/mg) | GERG EROD 30°C (pmol/min/mg) | NMFS AHH 25°C (pmol/min/mg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KACHB-L | CIR95FIS0001 | | 11:30 | 50 | 1.4 | U | 24,000 | 6,600 | <100 | 26.3 | 29.9 | 55 | 76 | 85 |
| KACHB-L | CIR95FIS0002 | | 11:38 | 58 | 1.8 | U | 15,000 | 2,900 | <100 | 25.6 | 25.6 | 70 | 93 | 88 |
| KACHB-L | CIR95FIS0003 | | 11:49 | 61 | 2.5 | U | 15,000 | 2,400 | <100 | 29.0 | 26.6 | 41 | 60 | 86 |
| KACHB-L | CIR95FIS0004 | 7/27/95 | 13:41 | 100 | 13.8 | M | 7,000 | 990 | <100 | 29.1 | 24.1 | 76 | 114 | 92 |
| KACHB-L | CIR95FIS0005 | | 13:46 | 75 | 5.4 | M | 9,000 | 1,300 | <100 | 27.5 | 25.5 | 57 | 89 | 100 |
| KACHB-L | CIR95FIS0006 | | 13:53 | 100 | 13.2 | M | 14,000 | 2,200 | <100 | 23.1 | 20.3 | 43 | 51 | 42 |
| KACHB-L | CIR95FIS0006D[a] | | 13:53 | 100 | 13.2 | M | 14,000 | 2,300 | <100 | N/A | N/A | N/A | N/A | N/A |
| KACHB-L | CIR95FIS0007 | | 23:40 | 60 | 2.5 | M | 7,600 | 1,100 | <100 | 24.9 | 28.4 | 58 | 91 | 117 |
| KAMIB-L | CIR95FIS0008 | | 13:43 | 94 | 9.8 | U | 14,000 | 2,700 | <100 | 22.9 | 24.3 | 13 | 19 | 35 |
| KAMIB-L | CIR95FIS0008D[a] | | 13:43 | 94 | 9.8 | U | N/A | N/A | N/A | 26.1 | 25.7 | 53 | 81 | 65 |
| KAMIB-F | CIR95FIS0009 | | 18:32 | 60 | 2.4 | U | 9,700 | 1,400 | <100 | 23.9 | 21.0 | 49 | 64 | 56 |
| KAMIB-L | CIR95FIS0011 | | 19:17 | 90 | 7.2 | U | 9,300 | 1,200 | <100 | 24.1 | 20.8 | 30 | 32 | 28 |
| KAMIB-L | CIR95FIS0012 | 7/29/95 | 19:30 | 82 | 5.8 | U | 8,600 | 1,300 | <100 | 29.9 | 26.4 | 34 | 56 | 52 |
| KAMIB-L | CIR95FIS0013 | | 19:45 | 59 | 2.4 | U | 12,000 | 1,800 | <100 | 30.9 | 30.2 | 40 | 64 | 88 |
| KAMIB-L | CIR95FIS0013D[a] | | 19:45 | 59 | 2.4 | U | 12,000 | 1,700 | <100 | 24.9 | 29.7 | 53 | 85 | 107 |
| KAMIB-L | CIR95FIS0014 | | 19:51 | 82 | 6 | U | 9,500 | 1,300 | <100 | 25.4 | 24.3 | 40 | 52 | 64 |
| KAMIB-L | CIR95FIS0015 | | 19:59 | 72 | 4 | U | 7,600 | 990 | <100 | 25.1 | 24.1 | 29 | 34 | 25 |
| KAMIB-L | CIR95FIS0015D[a] | | 19:59 | 72 | 4 | U | 7,700 | 1,100 | <100 | N/A | N/A | N/A | N/A | N/A |

GERG Geochemical and Environmental Research Group, Texas A&M University
NMFS National Marine Fisheries Service
U Undetermined
M Male
N/A Not Applicable
Sample numbers for Naphthalene, Phenanthrene, and Benzo(a)pyrene results have BIL in place of FIS.
Sample numbers for Protein, EROD, and AHH results have LIV in place of FIS.
[a] Lab Duplicate

### 3.3.2 Cytochrome P4501A Induction

Liver tissue of the same 14 Pacific halibut in which bile metabolite levels were documented were also subject to cytochrome P4501A analysis using the EROD assay, at GERG, and the AHH assay, at NMFS (Table 15). The EROD assay was performed at both 25°C (EROD_25) and 30°C (EROD_30). Maximum EROD activity was measured at 30°C, where values ranged from 51 to 114 pmol/min/mg for KACHB and 19 to 64 pmol/min/mg for KAMIB. Station means for EROD_30 were 82 and 46 pmol/min/mg for KACHB and KAMIB, respectively. Results of the AHH analyses, measured at 25°C, were comparable with the EROD_30, with station means of 87 and 50 pmol/min/mg for KACHB and KAMIB, respectively. The EROD_25 values were lower, with a range at KACHB of 41 to 76 pmol/min/mg and a mean of 57 pmol/min/mg. The EROD_25 at KAMIB ranged from 13 to 49 pmol/min/mg with a mean of 34 pmol/min/mg.

A two-sample *t*-test performed on log transformed EROD results indicated significant differences between the stations for all three parameters. Halibut collected at KACHB showed significantly more induction of P4501A compared to those collected at KAMIB, indicating that KACHB specimens had more exposure to anthropogenic hydrocarbons. However, the EROD and AHH data were low at both sites, which was in agreement with other parameters such as sediment PAH and bile metabolite data.

Procedural blanks analyzed with the EROD analyses at GERG all fell below MDLs. Of the two duplicate microsomal preparations analyzed in conjunction with EROD analyses, one (CIR95LIV00008) showed a significant difference. No corrective action was taken for this sample as this difference was not considered to significantly impact the data. The other duplicate (CIR95LIV0013) showed an acceptable RPD. Duplicate results are provided in Table 15.

## 3.4 Hydrographic Profiling

Hydrographic profile data were collected at each site occupied during both surveys as outlined in Section 2.1.4. Ten profiles were collected at six different stations as shown in Table 16. The waters of Cook Inlet are vertically well-mixed, as indicated by the hydrographic profiles and data in Appendix E. All of the observed differences in hydrographic parameters between stations can be attributed to geographic location within the Inlet. That is, the stations toward the mouth of the Inlet have, in general, higher salinities and percent transmittance due to the lack of influence from glacial freshwater sources. Therefore, the hydrographic data for this program will be discussed as a whole.

Temperatures among all stations and for both surveys ranged from a minimum of 5.9°C (NULLZ) to a maximum of 13.9°C (EFORE survey 2). A slight thermocline was observed at KACHB during both surveys but otherwise all stations were fairly isothermal. Salinities were found to vary from 19.9 ppt (EFORE survey 2) to 32.3 ppt (NULLZ survey 1). Dissolved oxygen (DO) values ranged from 8.5 to 11.6 mg/L. The DO percent saturation (UNESCO, 1973) for all stations and depths averaged 96.97 (n=571) with a standard deviation of 5.04. The average saturated value is well within the range expected for a body of water that undergoes such constant mixing. Values for pH ranged from 7.9 to 8.2 with little or no vertical stratification. Transmissivity values ranged from 0.0 percent transmittance at the upper stations (EFORE, TRADB) to a high of 86.8 percent transmittance at the mouth of the Inlet (NULLZ).

Quality control samples for hydrographic data included the collection of grab samples using a Niskin® bottle as described in Section 2.1.4. A summary of results is provided in Appendix E. Grab samples were analyzed for DO, salinity, temperature, and turbidity. Quality control results were used to validate the CTD probe performance and apply post-processing corrections to the CTD data if necessary. No corrections were applied to the raw CTD based on the QC results from both surveys. Winkler DO QC results agreed well with the CTD probe, and RPDs for DO were all below 7. Similarly, the RPDs for the other QC parameters all demonstrated good correlation with the CTD probe values.

## 3.5 Bivalve Condition Index

Bivalve densities at all stations were quite variable and, in general, quite low (Appendix F). The highest density of individuals from all taxa, combining all replicates, was observed at KAMIB (n=24), with the lowest density at EFORE where no individuals were recovered. A summary of the BCI results is presented in Table 17. Given the low numbers

## Table 16. Summary of Hydrographic Profile Data.

| Station | Survey | Date | Time | Sample Number | Water Column Level | Depth (m) | Temp (°C) | Salinity (‰) | pH (units) | DO (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| EFORE-H | 1 | 6/23/95 | 11:13 | CIR95CTD0001 | surface | 1.0 | 10.6 | 22.9 | 7.9 | 9.1 | 0.0 |
| | | | | CIR95CTD0007 | mid | 4.0 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| | | | | CIR95CTD0014 | bottom | 7.5 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| | 2 | 7/25/95 | 21:34 | CIR95CTD0424 | surface | 1.0 | 13.8 | 20.0 | 8.1 | 8.7 | 0.0 |
| | | | | CIR95CTD0434 | mid | 6.0 | 13.5 | 20.3 | 8.0 | 8.6 | 0.0 |
| | | | | CIR95CTD0448 | bottom | 13.0 | 13.4 | 20.6 | 8.0 | 9.0 | 0.0 |
| KACHB-H | 1 | 6/22/95 | 8:47 | CIR95CTD0017 | surface | 1.0 | 8.8 | 30.0 | 8.2 | 11.4 | 67.9 |
| | | | | CIR95CTD0030 | mid | 7.5 | 6.3 | 31.2 | 8.1 | 10.1 | 66.3 |
| | | | | CIR95CTD0048 | bottom | 16.5 | 6.2 | 31.3 | 8.1 | 10.1 | 58.5 |
| | 2 | 7/27/95 | 10:13 | CIR95CTD0450 | surface | 1.0 | 10.5 | 25.7 | 8.1 | 9.6 | 43.6 |
| | | | | CIR95CTD0458 | mid | 5.0 | 9.1 | 29.6 | 8.1 | 9.3 | 47.6 |
| | | | | CIR95CTD0469 | bottom | 10.5 | 8.5 | 30.5 | 8.1 | 9.3 | 42.5 |
| KAMIB-H | 1 | 6/21/95 | 11:11 | CIR95CTD0051 | surface | 1.0 | 9.9 | 29.4 | 8.2 | 9.9 | 67.4 |
| | | | | CIR95CTD0065 | mid | 8.0 | 8.8 | 29.9 | 8.1 | 9.6 | 68.1 |
| | | | | CIR95CTD0083 | bottom | 17.0 | 7.9 | 30.4 | 8.1 | 9.5 | 59.3 |
| | 2 | 7/29/95 | 17:04 | CIR95CTD0471 | surface | 1.0 | 11.1 | 29.9 | 8.2 | 9.4 | 63.4 |
| | | | | CIR95CTD0486 | mid | 8.5 | 11.0 | 30.0 | 8.2 | 9.4 | 64.8 |
| | | | | CIR95CTD0505 | bottom | 18.0 | 11.0 | 30.0 | 8.2 | 9.8 | 64.0 |
| NULLZ-H | 1 | 6/20/95 | 11:41 | CIR95CTD0085 | surface | 1.0 | 7.1 | 31.7 | 8.1 | 9.7 | 49.7 |
| | | | | CIR95CTD0225 | mid | 71.0 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| | | | | CIR95CTD0370 | bottom | 143.5 | 5.9 | 32.2 | 8.0 | 9.2 | 83.9 |
| SEKAM-H | 1 | 6/20/95 | 17:41 | CIR95CTD0371 | surface | 1.5 | 8.5 | 29.0 | 8.1 | 10.3 | 63.0 |
| | | | | CIR95CTD0381 | mid | 6.5 | 8.2 | 29.5 | 8.1 | 10.1 | 66.4 |
| | | | | CIR95CTD0397 | bottom | 14.5 | 7.7 | 30.2 | 8.1 | 9.8 | 68.1 |
| TRADB-H | 1 | 6/23/95 | 19:28 | CIR95CTD0398 | surface | 1.5 | 9.7 | 21.0 | 8.0 | 10.0 | 0.0 |
| | | | | CIR95CTD0408 | mid | 6.5 | 9.1 | 24.0 | 8.0 | 10.0 | 0.0 |
| | | | | CIR95CTD0422 | bottom | 13.5 | 9.0 | 24.5 | 8.0 | 10.0 | 0.0 |
| | 2 | 7/26/95 | 10:49 | CIR95CTD0507 | surface | 1.0 | 12.4 | 20.3 | 8.0 | 9.4 | 0.0 |
| | | | | CIR95CTD0511 | mid | 3.0 | 12.3 | 21.0 | 7.9 | 9.4 | 0.0 |
| | | | | CIR95CTD0517 | bottom | 6.0 | 12.3 | 21.2 | 7.9 | 9.3 | 0.0 |

## Table 17. Bivalve Condition Index Results*.

| Station | Date | Rep. | Sample Number | Taxon | BCI | Shell Volume (cc) | Tissue Weight (g) dry |
|---|---|---|---|---|---|---|---|
| NULLZ-S | 6/20/95 | 1 | CIR95BCI0001 | *Astarte montagui* | 16.67 | 0.30 | 0.05 |
| | | | CIR95BCI0002 | *Astarte alaskensis* | 12.00 | 0.25 | 0.03 |
| | | | CIR95BCI0003 | *Astarte montagui* | 21.43 | 0.14 | 0.03 |
| | | 2 | CIR95BCI0004 | *Astarte alaskensis* | 15.38 | 0.39 | 0.06 |
| | | | CIR95BCI0005 | *Astarte montagui* | 10.71 | 0.28 | 0.03 |
| | | | CIR95BCI0006 | *Astarte montagui* | 10.00 | 0.20 | 0.02 |
| KAMIB-S | 6/21/95 | 1 | CIR95BCI0007 | *Macoma spp.* | 16.90 | 0.71 | 0.12 |
| | | | CIR95BCI0008 | *Portlandia intermedia* | 20.00 | 0.15 | 0.03 |
| | | 2 | CIR95BCI0009 | *Portlandia intermedia* | 23.53 | 0.34 | 0.08 |
| | | | CIR95BCI0011 | *Portlandia intermedia* | 17.86 | 0.28 | 0.05 |
| | | | CIR95BCI0012 | *Portlandia intermedia* | 20.00 | 0.25 | 0.05 |
| | | | CIR95BCI0013 | *Macoma spp.* | 14.00 | 0.50 | 0.07 |
| | | | CIR95BCI0014 | *Macoma spp.* | 12.50 | 0.48 | 0.06 |
| | | | CIR95BCI0015 | *Portlandia intermedia* | 25.00 | 0.36 | 0.09 |
| | | | CIR95BCI0016 | *Macoma spp.* | 13.79 | 1.16 | 0.16 |
| | | | CIR95BCI0017 | *Portlandia intermedia* | 20.51 | 0.39 | 0.08 |
| | | | CIR95BCI0018 | *Astarte alaskensis* | 7.14 | 0.28 | 0.02 |
| | | | CIR95BCI0020 | *Macoma spp.* | 6.87 | 2.91 | 0.20 |
| | | | CIR95BCI0021 | *Macoma spp.* | 9.58 | 1.67 | 0.16 |
| | | | CIR95BCI0022 | *Macoma spp.* | 14.43 | 0.97 | 0.14 |
| | | | CIR95BCI0023 | *Macoma spp.* | 18.28 | 0.93 | 0.17 |
| | | | CIR95BCI0024 | *Macoma spp.* | 8.39 | 1.55 | 0.13 |
| | | | CIR95BCI0025 | *Macoma spp.* | 18.67 | 1.50 | 0.28 |
| | | 3 | CIR95BCI0026 | *Macoma spp.* | 12.39 | 2.26 | 0.28 |
| | | | CIR95BCI0027 | *Macoma spp.* | 14.49 | 2.14 | 0.31 |
| | | | CIR95BCI0029 | *Astarte montagui* | 10.29 | 0.68 | 0.07 |
| | | | CIR95BCI0030 | *Macoma spp.* | 13.41 | 1.79 | 0.24 |
| | | | CIR95BCI0031 | *Macoma spp.* | 11.36 | 0.44 | 0.05 |
| | | | CIR95BCI0032 | *Macoma spp.* | 7.05 | 2.41 | 0.17 |
| | | | CIR95BCI0033 | *Clinocardium ciliatum* | 9.68 | 2.48 | 0.24 |
| KACHB-S | 6/22/95 | 1 | CIR95BCI0035 | *Macoma spp.* | 18.52 | 0.27 | 0.05 |
| | | | CIR95BCI0036 | *Clinocardium ciliatum* | 16.00 | 0.25 | 0.04 |
| | | | CIR95BCI0037 | *Nuculana radiata* | 12.50 | 0.08 | 0.01 |
| | | | CIR95BCI0038 | *Nuculana radiata* | 33.33 | 0.06 | 0.02 |
| | | | CIR95BCI0039 | *Nuculana radiata* | 16.67 | 0.12 | 0.02 |
| | | | CIR95BCI0040 | *Nuculana radiata* | 20.00 | 0.10 | 0.02 |
| | | | CIR95BCI0041 | *Nuculana radiata* | 16.67 | 0.12 | 0.02 |
| | | 2 | CIR95BCI0042 | *Macoma spp.* | 28.57 | 0.63 | 0.18 |
| | | | CIR95BCI0044 | *Macoma spp.* | 14.29 | 0.21 | 0.03 |
| | | | CIR95BCI0045 | *Nuculana radiata* | 25.00 | 0.08 | 0.02 |
| | | 3 | CIR95BCI0049 | *Nuculana radiata* | 14.29 | 0.14 | 0.02 |
| | | | CIR95BCI0050 | *Nuculana radiata* | 18.18 | 0.11 | 0.02 |
| | | | CIR95BCI0051 | *Nuculana radiata* | 12.50 | 0.08 | 0.01 |
| TRADB-S | 6/23/95 | 1 | CIR95BCI0052 | *Yoldia amygdalea* | 21.15 | 0.52 | 0.11 |
| | | 2 | CIR95BCI0053 | *Macoma spp.* | 10.71 | 0.28 | 0.03 |
| | | 3 | CIR95BCI0054 | *Macoma spp.* | 8.70 | 0.23 | 0.02 |

* Results are from live bivalves only.

of bivalves recovered, the BCI results were calculated for all species and not just for *Macoma* spp. as proposed. These low numbers, however, precluded performing statistical analyses on the correlation of hydrocarbon parameters to the BCI of *Macoma* spp., since these individuals were only encountered at three of the five stations sampled (KACHB, KAMIB, TRADB). Individual BCI values ranged from a high of 33.33 for a *Nuculana radiata* at KACHB to a low of 6.87 for a *Macoma* spp. at KAMIB.

The BCI values for just the *Macoma* spp. individuals collected ranged from a low of 6.87 (KAMIB) to a high of 28.57 (KACHB). The mean BCI for *Macoma* spp. was 13.65 (n=20) with a standard deviation of 5.0. The range for mean BCI by station observed during the 1995 EMP (10 to 20) was very similar to the range observed on the pilot program (12 to 23; ADL, 1995a) and probably reflects the normal range of this parameter.

## 4.0 SUMMARY

In general, data from the 1995 EMP indicated that low levels of hydrocarbons exist in sediments and biota at the study sites. Total PAH concentrations in the 15 sediment samples collected were less than 130 ppb, with all but three replicates (from NULLZ) less than 65 ppb. All of the total PAH values are considerably lower than the Effects Range-Low (ER-L) of 4,000 ppb associated with adverse biological effects as defined by Long and Morgan (1990). However, levels of hydrocarbons at the NULLZ site appear to be twice as high as all those at all other sites. Fingerprints of sediment PAH results indicated a probable combination of petrogenic and pyrogenic sources, with petrogenic compounds being in higher abundance. In addition, no toxicity was demonstrated at any of the 1995 EMP sites. Continued monitoring of these parameters will allow the compiling of baseline data which can be used to identify future impacts in the study area, including both chronic, long-term inputs and more acute inputs such as oil releases.

Analyses of bile metabolites in Pacific halibut from two of the study sites also indicated low levels of hydrocarbons. Naphthalene and phenanthrene levels in fish bile were low, with maximum values of 24,000 and 6,000 ppb, respectively. Benzo(a)pyrene levels for all samples were below detection limits. These values compare favorably with other data reported from areas relatively unaffected by petroleum. For example, fish collected from remote sites (on the Antarctic Peninsula away from Palmer Station) demonstrated mean values of 33,000 ppb for naphthalene and 5,100 ppb for phenanthrene (McDonald et al., 1995). Samples from this area that were known to be in contaminated locations (near Arthur Harbor or the wreck of the *Bahia Paraiso*) showed much higher levels of these components. This type of biomarker analysis is becoming more prevalent, and continued study in this area, particularly with a species indigenous to Cook Inlet, should provide solid information on hydrocarbon exposure in commercially important species.

Liver P4501A induction also indicated low contaminant exposure. The mean EROD_25 value for KACHB was 57 pmol/min/mg, while KAMIB exhibited a mean of 34 pmol/min/mg. These values compare favorably with results from a recent study performed in Puget Sound which suggests that for English sole (*Pleuronectes vetulus*), EROD results (25°C) on composited fish liver samples from an uncontaminated area were quite low (<50 pmol/min/mg), while those from a more contaminated area were significantly different, with values as high as approximately 900 pmol/min/mg (Collier et al., 1995). While the results from the EMP are showing statistical significance between stations, clearly the magnitude of the difference between sites is minimal compared to that found in the Puget Sound study. The 1995 EMP results indicate that this biomarker measurement is a useful tool for assessing potential contaminants in fish in the study area, but it should be noted that more critical studies may be needed to evaluate this because of factors such as the age, sexual maturity, and gender of the fish that may affect these data. This is particularly important because of the low exposure levels and the small sample size of the data set. In addition, as suggested in the Puget Sound study, the use of composite samples (combining liver tissue from different specimens of the same species) and a larger sample size may be effective when comparing contaminated sites to less contaminated areas.

Bivalve densities at all sediment stations were quite variable and low. The range for mean BCI by station observed during the 1995 EMP was very similar to the range observed on the pilot program and probably reflects the normal range of this parameter. This parameter appears to be of limited value because of the low number of individuals encountered in the study area and the lack of bioaccumulation data with which to compare these values.

Hydrographic profiling performed during the 1995 EMP indicated that, in general, the waters of Cook Inlet are well-mixed. Observed differences in hydrographic parameters between stations can be attributed to the geographic location of the stations within this large body of water.

Use of SPMDs as bio-surrogates to help assess the bioavailability of hydrocarbons in the water column again met with some success but showed potential methodology problems. Hydrocarbons levels in SPMDs from TRADB were elevated compared to other sites. Increased hydrocarbon concentrations seen in 1995 data as compared to 1994 most likely reflect changes in SPMD technology as opposed to increases in ambient water concentrations. Before the method can be used in an applied sense, further research will be needed to address rates of uptake, use in high turbidity environments, and the influence on sequestering rates of the alkylation of parent PAHs. It is recommended that continued use of SPMDs include laboratory studies involving controlled testing of SPMD uptake of Cook Inlet crude or other hydrocarbons of interest.

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## GLOSSARY AND LIST OF ACRONYMS

### A

**ADF&G** - Alaska Department of Fish and Game

**ADL** - Arthur D. Little

**Aliphatic hydrocarbons** - Fully saturated normal alkanes (paraffins) and branched alkanes, n-$C_{10}$ to n-$C_{34}$; includes the isoprenoid compounds pristane ($C_{19}$) and phytane ($C_{20}$ ) which are often the most abundant isoprenoids in petroleum hydrocarbons.

**AMP** - Ampoule

**Analysis of variance (ANOVA)** - A large group of statistical methods under which null hypotheses can be tested by evaluating the equality of means.

**ANOVA** - Analysis of variance

**Anthropogenic** - Resulting from the influence of human activities (Refers to hydrocarbon input)

### B

**Bartlett's test of variance homogeneity** - A statistical test used to determine whether the variances of sets of three or more samples are equal.

**Biogenic** - Synthesized by plants and animals, including microbiota (Refers to hydrocarbon input)

**Bovine serum albumen (BSA)** - A protein source used in the process of cytochrome P4501A induction.

**Bray-Curtis similarity index** - A measure of how similar all pair-wise station or analyte combinations are to one another. From a matrix of transformed raw data a new matrix containing the percentage of similarity between pairs of stations or analytes is constructed. This index is sensitive to the presence or absence of analytes as well as their relative concentration when present.

**BSA** - Bovine serum albumin

### C

**°C** - Degrees Celsius

**cc** - Cubic centimeter

**CIRCAC** - Cook Inlet Regional Citizens Advisory Council

**cm** - Centimeter

**COC** - Chain of custody

**COE** - U.S. Army Corps of Engineers

**CTD Meter** - Conductivity, temperature, and depth instrument

**Cytochrome P4501A** - A subgroup of compounds in the large cytochrome P450 heme protein family which includes the enzymes ethoxyresorufin O-deethylase (EROD) and aryl hydrocarbon hydroxylase (AHH). The function of these enzymes includes the hydroxilation of steroids, barbiturates, and hydrocarbon contaminants to render them more water soluble so they may be excreted.

**Cytochrome P4501A induction** - The cytochrome P4501A induction method provides a measurement of contaminant exposure in teleost (bony) fish. Exposure to contaminants is indicated by elevated concentrations of the cytochrome P4501A enzymes EROD and AHH in liver tissue samples. EROD and AHH concentrations are typically low in animals unexposed to hydrocarbons.

### D

**Diagenic** - Resulting from alteration by microbial or chemical processes (Refers to hydrocarbon input)

**DO** - Dissolved oxygen

**Dunn's test** - A multiple comparison statistical test used in conjunction with a non-parametric ANOVA on ranked data. It is used to determine which mean ranks from a set of samples are significantly different from one another.

## E

**Electron-impacted ionization mode** - An ionization method that utilizes electrons to impact the analyte mixture to facilitate ionization.
**EFORE** - East Forelands
**EMP** - Environmental Monitoring Program
**EPA** - U. S. Environmental Protection Agency
**EPIRB** - Emergency position indicating radio beacon
**EROD** - Ethoxyresorufin O-deethylase
**Ethoxyresorufin O-deethylase (EROD)** - See Cytochrome P4501A
**EVOS** - *Exxon Valdez* oil spill

## F

**FFPI** - Fossil fuel pollution index
**Fossil fuel pollution index (FFPI)** - The fossil fuel pollution index is the ratio of fossil-derived PAHs to total PAHs calculated as FFPI = (N + F + P + D)/TPAH x 100, where:

N (Naphthalene series) = $C_0$-N + $C_1$-N + $C_2$-N + $C_3$-N + $C_4$-N
F (Fluorene series) = $C_0$-F + $C_1$-F + $C_2$-F + $C_3$-F
P (Phenanthrene/Anthracene series) = $C_0$-A +$C_0$-P + $C_1$-P + $C_2$-P + $C_3$-P + $C_4$-P
D (Dibenzothiophene series) = $C_0$-D + $C_1$-D + $C_2$-D + $C_3$-D.

An FFPI is near 100 for petrogenic PAH; FFPI for pyrogenic PAH is near 0 (Boehm and Farrington, 1984).

## G

**g** - Gram
**Gas chromatography with mass spectrometry detection (GC/MS)** - The process in which the components of a mixture are separated from one another according to their mass.
**GC/MS** - Gas chromatography with mass spectrometry detection.
**GERG** - Geochemical and Environmental Research Group of Texas A&M University
**Global positioning system (GPS)** - A satellite-based navigation system
**GPS** - Global positioning system

## H

**HEPES** - A pH buffer used in cytochrome P4501A enzyme induction analysis.
**Heteroscedastic** - The inequality or heterogeneity of variances
**High-performance liquid chromatography (HPLC)** - An analytical method based on separation of the components of a mixture in solution by selective adsorption.
**Homogeneous** - Uniform in structure or composition
**Homoscedastic** - The equality or homogeneity of variances
**HPLC** -High performance liquid chromatography
**HSD** - Honestly significant difference; See multiple range test (Tukey's HSD)

## I

**Indigenous** - Native or naturally occurring
***In situ*** - In the normal or natural position

## K

**KACHB** - Kachemak Bay
**KAMIB** - Kamishak Bay
**KLI** - Kinnetic Laboratories, Inc.
**Kruskal-Wallis test** - A non-parametric analog of ANOVA that tests for differences in ranked data grouped by a single classification variable.

## L

**L** - Liter

## M

**m** - Meter
**min** - Minutes
***Macoma* spp.** - Clam species of the genus *Macoma.*
**MDL** - Method detection limit
**Mean lower low water (MLLW)** - The average height of the daily lower low waters occurring over a 19 year period.
**Method detection limit (MDL)** - The lowest concentration of an analyte that a method can reliably detect.
**Microtox® sediment bioassay** - A toxicity testing method based on emission of light by the bacterium, *Photobacterium phosphoreum.* A measured decrease of luminescence in a population dosed with an organic extraction of sediment is used as a quantitative measure of toxicity.
**mg/L** - Milligrams per liter (parts per million)
**mg/mL** - Milligrams per milliliter
**mg/SPMD** - Milligrams per semi-permeable polymeric membrane device
**mL** - Milliliter
**MLLW** - Mean lower low water
**Multiple range test (Tukey's HSD)** - A multiple comparison statistical test used in conjunction with parametric ANOVA. It is used to determine which means from a set of samples are significantly different from one another. "HSD" is the acronym for "honestly significant difference." This test requires equal sample sizes.
***Mytilus edulis*** - Blue mussel

## N

**ND** - Non-detect
**NTU** - Nephelometric turbidity units
**ng/amp** - Nanograms per ampoule
**ng/g** - Nanograms per gram (parts per billion)
**ng/SPMD** - Nanograms per semi-permeable polymeric membrane device
**NIST** - National Institute of Standards and Technology
**NOAA** - National Oceanic and Atmospheric Administration
**Non-parametric** - A body of statistical testing methods not requiring the estimation of population variance or mean and not stating hypotheses about parameters.
**Null** - A database value description which means "not applicable"
**NULLZ** - Null Zone sampling site.

## P

**PAH** - Polycyclic aromatic hydrocarbons
**Particle grain size (PGS)** - Percent gravel, sand, silt, and clay
**Pearson's Correlation** - A parametric statistic that reflects the degree of association between two sets of paired data. This is the statistic commonly referred to as the "correlation coefficient".
**Percent lipid** - Concentration of lipid as a fraction of the total tissue weight; Lipid material in mussel tissue is the primary storage area for hydrocarbons; gametes are mostly comprised of lipids.
**Petrogenic** - Resulting from natural geologic processes which originally form petrochemicals (refers to petroleum hydrocarbon input)
**PGS** - Particle grain size (percent gravel, sand, silt, and clay)
**pH** - A symbol for expressing the concentration of hydrogen or hydroxyl ions. In a scale ranging from 0 to 14 which represents the acidity or alkalinity of a solution. A neutral solution, such as water, has a pH of 7; whereas acid solutions have a pH less than 7 and alkaline solutions have a pH more than 7.
**pmol/min/mg** - Picomoles per minute per milligram

**Polycyclic aromatic hydrocarbons (PAH)** - 2- to 6-ring polycyclic aromatic hydrocarbon compounds; includes homologous series of aromatic hydrocarbons consisting of unsubstituted (parent) compounds, such as naphthalene, and substituted compounds, which are similar structures with alkyl side chains that replace hydrogen ions, such as $C_1$-naphthalene.

**PPB** - Parts per billion

**PPM** - Parts per million

**PPT** - Parts per thousand (‰)

**Pyrogenic** - Resulting from the activity of fire or very high temperature (Refers to hydrocarbon input from high temperature, incomplete combustion of fossil fuels, or creosote)

# Q

**QA** - Quality assurance

**QC** - Quality control

**Qualifier code** - Character used to qualify data based on method detection limits, matrix interference, or other performance parameters.

# R

**Relative percent difference (RPD)** - A measure of precision calculated by dividing the difference between duplicate measurements by the mean of the duplicate measurements and multiplying by 100%.

**RPD** - Relative percent difference

# S

**SEKAM** - Southeast Kamishak Bay

**Selected ion monitoring (SIM)** - A gas chromatograph operating mode in which the detection range is limited to include only the masses of the desired analytes.

**SIM** - Selected ion monitoring

**SOP** - Standard operating procedure

**Soxhlet extractor** - A laboratory apparatus consisting of a glass flask and condensing unit used for continuous reflux extraction of alcohol- or ether-soluble components.

**Spearman's Rank Correlation Coefficients** - A non-parametric statistic that reflects the degree of association between two sets of paired ranked data.

**SPMD** - Semi-permeable membrane device

**SRM** - Standard reference material

**Standard reference material (SRM)** - A certified known concentration of a compound that is analyzed in conjunction with samples for Quality Assurance/Quality Control (QA/QC) purposes.

# T

**TAHC** - Total aliphatic hydrocarbons

**THC** - Total hydrocarbons

**TIC** - Total inorganic carbon

**TOC** - Total organic carbon

**Total aliphatic hydrocarbons (TAHC)** - See aliphatic hydrocarbons

**Total hydrocarbons (THC)** - Total extractable hydrocarbon material minus polar-type compounds.

**Total inorganic carbon (TIC)** - The percent by dry weight of carbonate (inorganic) carbon, determined as the difference between total carbon and total organic carbon (TOC).

**Total organic carbon (TOC)** - The percentage by dry weight of organic carbon in a sediment sample.

**Total polycyclic aromatic hydrocarbons (TPAH)** - See polycyclic aromatic hydrocarbons

**TPAH** - Total polycyclic aromatic hydrocarbons

**TRADB** - Trading Bay

## U

$\mu g/g$ - Micrograms per gram
USCG - U.S. Coast Guard
USGS - U.S. Geological Survey

## V

**Van Veen grab** - Device used for collection of subtidal marine sediments.

# APPENDIX A

## Sampling Information

## 1.0 Sediment Stations

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RCAC941700OR | EFORE-S | .NULL. | .NULL. | SAMP | SEDIMENT | 60 | 45 | 42.4 | 151 | 19 | 26.3 | 7/04/94 | 21:45 | -8.5 |
| RCAC941700ORs | EFORE-S | .NULL. | .NULL. | SONICATE | SEDIMENT | 60 | 45 | 42.4 | 151 | 19 | 26.3 | 7/04/94 | 21:45 | -8.5 |
| CIR95MCT0010 | EFORE-S | 1 | 1 | SAMP | SEDIMENT | 60 | 45 | 36.6 | 151 | 17 | 6.6 | 6/23/95 | 11:34 | -5.173 |
| CIR95MCT0011 | EFORE-S | 1 | 2 | SAMP | SEDIMENT | 60 | 45 | 39 | 151 | 17 | 11.3 | 6/23/95 | 11:51 | -5.607 |
| CIR95MCT0012 | EFORE-S | 1 | 3 | SAMP | SEDIMENT | 60 | 45 | 36.8 | 151 | 17 | 7.4 | 6/23/95 | 12:03 | -6.107 |
| CIR95PGS0010 | EFORE-S | 1 | 1 | SAMP | SEDIMENT | 60 | 45 | 36.6 | 151 | 17 | 6.6 | 6/23/95 | 11:34 | -5.173 |
| CIR95PGS0011 | EFORE-S | 1 | 2 | SAMP | SEDIMENT | 60 | 45 | 39 | 151 | 17 | 11.3 | 6/23/95 | 11:51 | -5.607 |
| CIR95PGS0012 | EFORE-S | 1 | 3 | SAMP | SEDIMENT | 60 | 45 | 36.8 | 151 | 17 | 7.4 | 6/23/95 | 12:03 | -6.107 |
| CIR95PTT0010 | EFORE-S | 1 | 1 | SAMP | SEDIMENT | 60 | 45 | 36.6 | 151 | 17 | 6.6 | 6/23/95 | 11:34 | -5.173 |
| CIR95PTT0011 | EFORE-S | 1 | 2 | SAMP | SEDIMENT | 60 | 45 | 39 | 151 | 17 | 11.3 | 6/23/95 | 11:51 | -5.607 |
| CIR95PTT0012 | EFORE-S | 1 | 3 | SAMP | SEDIMENT | 60 | 45 | 36.8 | 151 | 17 | 7.4 | 6/23/95 | 12:03 | -6.107 |
| CIR95BCI0034 | KACHB-S | 1 | 1 | SAMP | BIVALVE | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95BCI0035 | KACHB-S | 1 | 1 | SAMP | BIVALVE | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95BCI0036 | KACHB-S | 1 | 1 | SAMP | BIVALVE | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95BCI0037 | KACHB-S | 1 | 1 | SAMP | BIVALVE | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95BCI0038 | KACHB-S | 1 | 1 | SAMP | BIVALVE | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95BCI0039 | KACHB-S | 1 | 1 | SAMP | BIVALVE | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95BCI0040 | KACHB-S | 1 | 1 | SAMP | BIVALVE | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95BCI0041 | KACHB-S | 1 | 1 | SAMP | BIVALVE | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95BCI0042 | KACHB-S | 1 | 2 | SAMP | BIVALVE | 59 | 37 | 57.1 | 151 | 23 | 47.4 | 6/22/95 | 10:04 | -14.42 |
| CIR95BCI0043 | KACHB-S | 1 | 2 | SAMP | BIVALVE | 59 | 37 | 57.1 | 151 | 23 | 47.4 | 6/22/95 | 10:04 | -14.42 |
| CIR95BCI0044 | KACHB-S | 1 | 2 | SAMP | BIVALVE | 59 | 37 | 57.1 | 151 | 23 | 47.4 | 6/22/95 | 10:04 | -14.42 |
| CIR95BCI0045 | KACHB-S | 1 | 2 | SAMP | BIVALVE | 59 | 37 | 57.1 | 151 | 23 | 47.4 | 6/22/95 | 10:04 | -14.42 |
| CIR95BCI0046 | KACHB-S | 1 | 2 | SAMP | BIVALVE | 59 | 37 | 57.1 | 151 | 23 | 47.4 | 6/22/95 | 10:04 | -14.42 |
| CIR95BCI0047 | KACHB-S | 1 | 2 | SAMP | BIVALVE | 59 | 37 | 57.1 | 151 | 23 | 47.4 | 6/22/95 | 10:04 | -14.42 |
| CIR95BCI0048 | KACHB-S | 1 | 3 | SAMP | BIVALVE | 59 | 38 | 0.6 | 151 | 23 | 47.8 | 6/22/95 | 10:19 | -14.17 |
| CIR95BCI0049 | KACHB-S | 1 | 3 | SAMP | BIVALVE | 59 | 38 | 0.6 | 151 | 23 | 47.8 | 6/22/95 | 10:19 | -14.17 |
| CIR95BCI0050 | KACHB-S | 1 | 3 | SAMP | BIVALVE | 59 | 38 | 0.6 | 151 | 23 | 47.8 | 6/22/95 | 10:19 | -14.17 |
| CIR95BCI0051 | KACHB-S | 1 | 3 | SAMP | BIVALVE | 59 | 38 | 0.6 | 151 | 23 | 47.8 | 6/22/95 | 10:19 | -14.17 |
| CIR95MCT0007 | KACHB-S | 1 | 1 | SAMP | SEDIMENT | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95MCT0008 | KACHB-S | 1 | 2 | SAMP | SEDIMENT | 59 | 37 | 57.1 | 151 | 23 | 47.4 | 6/22/95 | 10:04 | -14.42 |
| CIR95MCT0009 | KACHB-S | 1 | 3 | SAMP | SEDIMENT | 59 | 38 | 0.6 | 151 | 23 | 47.8 | 6/22/95 | 10:19 | -14.17 |
| CIR95PGS0007 | KACHB-S | 1 | 1 | SAMP | SEDIMENT | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95PGS0008 | KACHB-S | 1 | 2 | SAMP | SEDIMENT | 59 | 37 | 57.1 | 151 | 23 | 47.4 | 6/22/95 | 10:04 | -14.42 |
| CIR95PGS0009 | KACHB-S | 1 | 3 | SAMP | SEDIMENT | 59 | 38 | 0.6 | 151 | 23 | 47.8 | 6/22/95 | 10:19 | -14.17 |
| CIR95PTT0007 | KACHB-S | 1 | 1 | SAMP | SEDIMENT | 59 | 37 | 59.4 | 151 | 23 | 48.3 | 6/22/95 | 9:09 | -15.17 |
| CIR95PTT0008 | KACHB-S | 1 | 2 | SAMP | SEDIMENT | 59 | 37 | 57.1 | 151 | 23 | 47.4 | 6/22/95 | 10:04 | -14.42 |
| CIR95PTT0009 | KACHB-S | 1 | 3 | SAMP | SEDIMENT | 59 | 38 | 0.6 | 151 | 23 | 47.8 | 6/22/95 | 10:19 | -14.17 |
| CIR95BCI0007 | KAMIB-S | 1 | 1 | SAMP | BIVALVE | 59 | 22 | 35.8 | 153 | 46 | 2.3 | 6/21/95 | 11:32 | -14.97 |
| CIR95BCI0008 | KAMIB-S | 1 | 1 | SAMP | BIVALVE | 59 | 22 | 35.8 | 153 | 46 | 2.3 | 6/21/95 | 11:32 | -14.97 |
| CIR95BCI0009 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0010 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0011 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0012 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0013 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0014 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0015 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0016 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0017 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0018 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0019 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0020 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0021 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0022 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0023 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0024 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0025 | KAMIB-S | 1 | 2 | SAMP | BIVALVE | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95BCI0026 | KAMIB-S | 1 | 3 | SAMP | BIVALVE | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95BCI0027 | KAMIB-S | 1 | 3 | SAMP | BIVALVE | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95BCI0028 | KAMIB-S | 1 | 3 | SAMP | BIVALVE | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95BCI0029 | KAMIB-S | 1 | 3 | SAMP | BIVALVE | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95BCI0030 | KAMIB-S | 1 | 3 | SAMP | BIVALVE | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95BCI0031 | KAMIB-S | 1 | 3 | SAMP | BIVALVE | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95BCI0032 | KAMIB-S | 1 | 3 | SAMP | BIVALVE | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95BCI0033 | KAMIB-S | 1 | 3 | SAMP | BIVALVE | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95MCT0004 | KAMIB-S | 1 | 1 | SAMP | SEDIMENT | 59 | 22 | 35.8 | 153 | 46 | 2.3 | 6/21/95 | 11:32 | -14.97 |
| CIR95MCT0005 | KAMIB-S | 1 | 2 | SAMP | SEDIMENT | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95MCT0006 | KAMIB-S | 1 | 3 | SAMP | SEDIMENT | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95PGS0004 | KAMIB-S | 1 | 1 | SAMP | SEDIMENT | 59 | 22 | 35.8 | 153 | 46 | 2.3 | 6/21/95 | 11:32 | -14.97 |
| CIR95PGS0005 | KAMIB-S | 1 | 2 | SAMP | SEDIMENT | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95PGS0006 | KAMIB-S | 1 | 3 | SAMP | SEDIMENT | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95PTT0004 | KAMIB-S | 1 | 1 | SAMP | SEDIMENT | 59 | 22 | 35.8 | 153 | 46 | 2.3 | 6/21/95 | 11:32 | -14.97 |

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95PTT0005 | KAMIB-S | 1 | 2 | SAMP | SEDIMENT | 59 | 22 | 39.4 | 153 | 46 | 2.2 | 6/21/95 | 11:58 | -15.09 |
| CIR95PTT0006 | KAMIB-S | 1 | 3 | SAMP | SEDIMENT | 59 | 22 | 35.4 | 153 | 45 | 56.7 | 6/21/95 | 12:12 | -15.09 |
| CIR95BCI0001 | NULLZ-S | 1 | 1 | SAMP | BIVALVE | 59 | 4 | 36.6 | 152 | 48 | 39 | 6/20/95 | 10:23 | -109.8 |
| CIR95BCI0002 | NULLZ-S | 1 | 1 | SAMP | BIVALVE | 59 | 4 | 36.6 | 152 | 48 | 39 | 6/20/95 | 10:23 | -109.8 |
| CIR95BCI0003 | NULLZ-S | 1 | 1 | SAMP | BIVALVE | 59 | 4 | 36.6 | 152 | 48 | 39 | 6/20/95 | 10:23 | -109.8 |
| CIR95BCI0004 | NULLZ-S | 1 | 2 | SAMP | BIVALVE | 59 | 5 | 1.1 | 152 | 48 | 46.9 | 6/20/95 | 11:02 | -109.0 |
| CIR95BCI0005 | NULLZ-S | 1 | 2 | SAMP | BIVALVE | 59 | 5 | 1.1 | 152 | 48 | 46.9 | 6/20/95 | 11:02 | -109.0 |
| CIR95BCI0006 | NULLZ-S | 1 | 2 | SAMP | BIVALVE | 59 | 5 | 1.1 | 152 | 48 | 46.9 | 6/20/95 | 11:02 | -109.0 |
| CIR95MCT0001 | NULLZ-S | 1 | 1 | SAMP | SEDIMENT | 59 | 4 | 36.6 | 152 | 48 | 39 | 6/20/95 | 10:23 | -109.8 |
| CIR95MCT0002 | NULLZ-S | 1 | 2 | SAMP | SEDIMENT | 59 | 5 | 1.1 | 152 | 48 | 46.9 | 6/20/95 | 11:02 | -109.0 |
| CIR95MCT0003 | NULLZ-S | 1 | 3 | SAMP | SEDIMENT | 59 | 5 | 2.3 | 152 | 48 | 52.8 | 6/20/95 | 11:21 | -110.2 |
| CIR95PGS0001 | NULLZ-S | 1 | 1 | SAMP | SEDIMENT | 59 | 4 | 36.6 | 152 | 48 | 39 | 6/20/95 | 10:23 | -109.8 |
| CIR95PGS0002 | NULLZ-S | 1 | 2 | SAMP | SEDIMENT | 59 | 5 | 1.1 | 152 | 48 | 46.9 | 6/20/95 | 11:02 | -109.0 |
| CIR95PGS0003 | NULLZ-S | 1 | 3 | SAMP | SEDIMENT | 59 | 5 | 2.3 | 152 | 48 | 52.8 | 6/20/95 | 11:21 | -110.2 |
| CIR95PTT0001 | NULLZ-S | 1 | 1 | SAMP | SEDIMENT | 59 | 4 | 36.6 | 152 | 48 | 39 | 6/20/95 | 10:23 | -109.8 |
| CIR95PTT0002 | NULLZ-S | 1 | 2 | SAMP | SEDIMENT | 59 | 5 | 1.1 | 152 | 48 | 46.9 | 6/20/95 | 11:02 | -109.0 |
| CIR95PTT0003 | NULLZ-S | 1 | 3 | SAMP | SEDIMENT | 59 | 5 | 2.3 | 152 | 48 | 52.8 | 6/20/95 | 11:21 | -110.2 |
| RCAC940500OR | TRADB-S | .NULL. | .NULL. | SAMP | SEDIMENT | 60 | 49 | 41 | 151 | 42 | 35.7 | 7/01/94 | 16:55 | -13 |
| RCAC940500ORs | TRADB-S | .NULL. | .NULL. | SONICATE | SEDIMENT | 60 | 49 | 41 | 151 | 42 | 35.7 | 7/01/94 | 16:55 | -13 |
| RCAC940600OR | TRADB-S | .NULL. | .NULL. | SAMP | SEDIMENT | 60 | 51 | 31.1 | 151 | 42 | 3.42 | 7/01/94 | 17:20 | -14 |
| RCAC940600ORs | TRADB-S | .NULL. | .NULL. | SONICATE | SEDIMENT | 60 | 51 | 31.1 | 151 | 42 | 3.42 | 7/01/94 | 17:20 | -14 |
| CIR95BCI0052 | TRADB-S | 1 | 1 | SAMP | BIVALVE | 60 | 51 | 33 | 151 | 41 | 42.9 | 6/23/95 | 19:46 | -10.30 |
| CIR95BCI0053 | TRADB-S | 1 | 2 | SAMP | BIVALVE | 60 | 51 | 27.3 | 151 | 41 | 47.8 | 6/23/95 | 19:58 | -10.30 |
| CIR95BCI0054 | TRADB-S | 1 | 3 | SAMP | BIVALVE | 60 | 51 | 24.6 | 151 | 41 | 50.9 | 6/23/95 | 20:09 | -10.30 |
| CIR95MCT0013 | TRADB-S | 1 | 1 | SAMP | SEDIMENT | 60 | 51 | 33 | 151 | 41 | 42.9 | 6/23/95 | 19:46 | -10.30 |
| CIR95MCT0014 | TRADB-S | 1 | 2 | SAMP | SEDIMENT | 60 | 51 | 27.3 | 151 | 41 | 47.8 | 6/23/95 | 19:58 | -10.30 |
| CIR95MCT0015 | TRADB-S | 1 | 3 | SAMP | SEDIMENT | 60 | 51 | 24.6 | 151 | 41 | 50.9 | 6/23/95 | 20:09 | -10.30 |
| CIR95PGS0013 | TRADB-S | 1 | 1 | SAMP | SEDIMENT | 60 | 51 | 33 | 151 | 41 | 42.9 | 6/23/95 | 19:46 | -10.30 |
| CIR95PGS0014 | TRADB-S | 1 | 2 | SAMP | SEDIMENT | 60 | 51 | 27.3 | 151 | 41 | 47.8 | 6/23/95 | 19:58 | -10.30 |
| CIR95PGS0015 | TRADB-S | 1 | 3 | SAMP | SEDIMENT | 60 | 51 | 24.6 | 151 | 41 | 50.9 | 6/23/95 | 20:09 | -10.30 |
| CIR95PTB0001 | TRADB-S | 1 | .NULL. | FB | WATER | 60 | 51 | 24.6 | 151 | 41 | 50.9 | 6/23/95 | 20:29 | .NULL. |
| CIR95PTB0002 | TRADB-S | 1 | .NULL. | EB | WATER | 60 | 51 | 24.6 | 151 | 41 | 50.9 | 6/23/95 | 20:21 | .NULL. |
| CIR95PTT0013 | TRADB-S | 1 | 1 | SAMP | SEDIMENT | 60 | 51 | 33 | 151 | 41 | 42.9 | 6/23/95 | 19:46 | -10.30 |
| CIR95PTT0014 | TRADB-S | 1 | 2 | SAMP | SEDIMENT | 60 | 51 | 27.3 | 151 | 41 | 47.8 | 6/23/95 | 19:58 | -10.30 |
| CIR95PTT0015 | TRADB-S | 1 | 3 | SAMP | SEDIMENT | 60 | 51 | 24.6 | 151 | 41 | 50.9 | 6/23/95 | 20:09 | -10.30 |

# APPENDIX A

## Sampling Information

## 2.0 SPMD Moorings

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95SPM0003 | EFORE-M | 1 | .NULL. | FB | LIPID | 60 | 46 | 16.3 | 151 | 16 | 47.3 | 6/24/95 | 1:34 | .NULL. |
| CIR95SPM0004 | EFORE-M | 2 | .NULL. | SAMP | LIPID | 60 | 46 | 16.3 | 151 | 16 | 47.3 | 7/25/95 | 23:28 | -2.5 |
| CIR95SPM0005 | EFORE-M | 2 | .NULL. | SAMP | LIPID | 60 | 46 | 16.3 | 151 | 16 | 47.3 | 7/25/95 | 23:25 | -8.373 |
| CIR95SPM0001 | KACHB-M | 1 | .NULL. | FB | LIPID | 59 | 37 | 58.3 | 151 | 23 | 45.7 | 6/22/95 | 14:36 | .NULL. |
| CIR95SPM0008 | KACHB-M | 2 | .NULL. | SAMP | LIPID | 59 | 37 | 58.3 | 151 | 23 | 45.7 | 7/27/95 | 9:15 | -2.5 |
| CIR95SPM0009 | KACHB-M | 2 | .NULL. | SAMP | LIPID | 59 | 37 | 58.3 | 151 | 23 | 45.7 | 7/27/95 | 9:39 | -12.71 |
| CIR95SPM0002 | TRADB-M | 1 | .NULL. | FB | LIPID | 60 | 48 | 35.8 | 151 | 42 | 34.4 | 6/23/95 | 23:31 | .NULL. |
| CIR95SPM0006 | TRADB-M | 2 | .NULL. | SAMP | LIPID | 60 | 48 | 35.8 | 151 | 42 | 34.4 | 7/26/95 | 11:45 | -2.5 |
| CIR95SPM0007 | TRADB-M | 2 | .NULL. | SAMP | LIPID | 60 | 48 | 35.8 | 151 | 42 | 34.4 | 7/26/95 | 11:46 | -4.476 |

# APPENDIX A

## Sampling Information

## 3.0 Fish Collection Stations

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95BIL0001 | KACHB-L | 2 | 2 | SAMP | BILE | 59 | 38 | 2.0 | 151 | 23 | 52.0 | 7/27/95 | 11:30 | -13.33 |
| CIR95BIL0002 | KACHB-L | 2 | 2 | SAMP | BILE | 59 | 38 | 2.0 | 151 | 23 | 52.0 | 7/27/95 | 11:38 | -13.33 |
| CIR95BIL0003 | KACHB-L | 2 | 2 | SAMP | BILE | 59 | 38 | 2.0 | 151 | 23 | 52.0 | 7/27/95 | 11:49 | -13.33 |
| CIR95BIL0004 | KACHB-L | 2 | 3 | SAMP | BILE | 59 | 38 | 4.5 | 151 | 23 | 50.2 | 7/27/95 | 13:41 | -11.21 |
| CIR95BIL0005 | KACHB-L | 2 | 3 | SAMP | BILE | 59 | 38 | 4.5 | 151 | 23 | 50.2 | 7/27/95 | 13:46 | -11.21 |
| CIR95BIL0006 | KACHB-L | 2 | 3 | SAMP | BILE | 59 | 38 | 4.5 | 151 | 23 | 50.2 | 7/27/95 | 13:53 | -11.21 |
| CIR95BIL0007 | KACHB-L | 2 | 6 | SAMP | BILE | 59 | 38 | 15.0 | 151 | 23 | 53.5 | 7/27/95 | 23:40 | -10.67 |
| CIR95BIL0010 | KACHB-L | 2 | 1 | SAMP | BILE | 59 | 38 | 6.1 | 151 | 23 | 50.2 | 7/26/95 | 20:35 | -12.63 |
| CIR95FIS0001 | KACHB-L | 2 | 2 | SAMP | FISH | 59 | 38 | 2.0 | 151 | 23 | 52.0 | 7/27/95 | 11:30 | -13.33 |
| CIR95FIS0002 | KACHB-L | 2 | 2 | SAMP | FISH | 59 | 38 | 2.0 | 151 | 23 | 52.0 | 7/27/95 | 11:38 | -13.33 |
| CIR95FIS0003 | KACHB-L | 2 | 2 | SAMP | FISH | 59 | 38 | 2.0 | 151 | 23 | 52.0 | 7/27/95 | 11:49 | -13.33 |
| CIR95FIS0004 | KACHB-L | 2 | 3 | SAMP | FISH | 59 | 38 | 4.5 | 151 | 23 | 50.2 | 7/27/95 | 13:41 | -11.21 |
| CIR95FIS0005 | KACHB-L | 2 | 3 | SAMP | FISH | 59 | 38 | 4.5 | 151 | 23 | 50.2 | 7/27/95 | 13:46 | -11.21 |
| CIR95FIS0006 | KACHB-L | 2 | 3 | SAMP | FISH | 59 | 38 | 4.5 | 151 | 23 | 50.2 | 7/27/95 | 13:53 | -11.21 |
| CIR95FIS0007 | KACHB-L | 2 | 6 | SAMP | FISH | 59 | 38 | 15.0 | 151 | 23 | 53.5 | 7/27/95 | 23:40 | -10.67 |
| CIR95FIS0010 | KACHB-L | 2 | 1 | SAMP | FISH | 59 | 38 | 6.1 | 151 | 23 | 50.2 | 7/26/95 | 20:35 | -12.63 |
| CIR95LIV0001 | KACHB-L | 2 | 2 | SAMP | LIVER | 59 | 38 | 2.0 | 151 | 23 | 52.0 | 7/27/95 | 11:30 | -13.33 |
| CIR95LIV0002 | KACHB-L | 2 | 2 | SAMP | LIVER | 59 | 38 | 2.0 | 151 | 23 | 52.0 | 7/27/95 | 11:38 | -13.33 |
| CIR95LIV0003 | KACHB-L | 2 | 2 | SAMP | LIVER | 59 | 38 | 2.0 | 151 | 23 | 52.0 | 7/27/95 | 11:49 | -13.33 |
| CIR95LIV0004 | KACHB-L | 2 | 3 | SAMP | LIVER | 59 | 38 | 4.5 | 151 | 23 | 50.2 | 7/27/95 | 13:41 | -11.21 |
| CIR95LIV0005 | KACHB-L | 2 | 3 | SAMP | LIVER | 59 | 38 | 4.5 | 151 | 23 | 50.2 | 7/27/95 | 13:46 | -11.21 |
| CIR95LIV0006 | KACHB-L | 2 | 3 | SAMP | LIVER | 59 | 38 | 4.5 | 151 | 23 | 50.2 | 7/27/95 | 13:53 | -11.21 |
| CIR95LIV0007 | KACHB-L | 2 | 6 | SAMP | LIVER | 59 | 38 | 15.0 | 151 | 23 | 53.5 | 7/27/95 | 23:40 | -10.67 |
| CIR95LIV0010 | KACHB-L | 2 | 1 | SAMP | LIVER | 59 | 38 | 6.1 | 151 | 23 | 50.2 | 7/26/95 | 20:35 | -12.63 |
| CIR95BIL0009 | KAMIB-F | 2 | 1 | SAMP | BILE | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 18:32 | -17.73 |
| CIR95FIS0009 | KAMIB-F | 2 | 1 | SAMP | FISH | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 18:32 | -17.73 |
| CIR95LIV0009 | KAMIB-F | 2 | 1 | SAMP | LIVER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 18:32 | -17.73 |
| CIR95BIL0008 | KAMIB-L | 2 | 1 | SAMP | BILE | 59 | 21 | 5.2 | 153 | 34 | 36.7 | 7/29/95 | 13:43 | -7.35 |
| CIR95BIL0011 | KAMIB-L | 2 | 4 | SAMP | BILE | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:17 | -17.12 |
| CIR95BIL0012 | KAMIB-L | 2 | 4 | SAMP | BILE | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:30 | -17.12 |
| CIR95BIL0013 | KAMIB-L | 2 | 4 | SAMP | BILE | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:45 | -17.12 |
| CIR95BIL0014 | KAMIB-L | 2 | 4 | SAMP | BILE | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:51 | -17.12 |
| CIR95BIL0015 | KAMIB-L | 2 | 4 | SAMP | BILE | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:59 | -17.12 |
| CIR95FIS0008 | KAMIB-L | 2 | 1 | SAMP | FISH | 59 | 21 | 5.2 | 153 | 34 | 36.7 | 7/29/95 | 13:43 | -7.35 |
| CIR95FIS0011 | KAMIB-L | 2 | 4 | SAMP | FISH | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:17 | -17.12 |
| CIR95FIS0012 | KAMIB-L | 2 | 4 | SAMP | FISH | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:30 | -17.12 |
| CIR95FIS0013 | KAMIB-L | 2 | 4 | SAMP | FISH | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:45 | -17.12 |
| CIR95FIS0014 | KAMIB-L | 2 | 4 | SAMP | FISH | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:51 | -17.12 |
| CIR95FIS0015 | KAMIB-L | 2 | 4 | SAMP | FISH | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:59 | -17.12 |
| CIR95LIV0008 | KAMIB-L | 2 | 1 | SAMP | LIVER | 59 | 21 | 5.2 | 153 | 34 | 36.7 | 7/29/95 | 13:43 | -7.35 |
| CIR95LIV0011 | KAMIB-L | 2 | 4 | SAMP | LIVER | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:17 | -17.12 |
| CIR95LIV0012 | KAMIB-L | 2 | 4 | SAMP | LIVER | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:30 | -17.12 |
| CIR95LIV0013 | KAMIB-L | 2 | 4 | SAMP | LIVER | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:45 | -17.12 |
| CIR95LIV0014 | KAMIB-L | 2 | 4 | SAMP | LIVER | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:51 | -17.12 |
| CIR95LIV0015 | KAMIB-L | 2 | 4 | SAMP | LIVER | 59 | 22 | 35.4 | 153 | 46 | 12.0 | 7/29/95 | 19:59 | -17.12 |

# APPENDIX A

## Sampling Information

## 4.0 Hydrographic Stations

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95CTD0001 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -1.00 |
| CIR95CTD0002 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -1.50 |
| CIR95CTD0003 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -2.00 |
| CIR95CTD0004 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -2.50 |
| CIR95CTD0005 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -3.00 |
| CIR95CTD0006 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -3.50 |
| CIR95CTD0007 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -4.00 |
| CIR95CTD0008 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -4.50 |
| CIR95CTD0009 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -5.00 |
| CIR95CTD0010 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -5.50 |
| CIR95CTD0011 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -6.00 |
| CIR95CTD0012 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -6.50 |
| CIR95CTD0013 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -7.00 |
| CIR95CTD0014 | EFORE-H | 1 | .NULL. | SAMP | WATER | 60 | 45 | 36.7 | 151 | 17 | 5.4 | 6/23/95 | 11:13 | -7.50 |
| CIR95CTD0423 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -0.50 |
| CIR95CTD0424 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -1.00 |
| CIR95CTD0425 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -1.50 |
| CIR95CTD0426 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -2.00 |
| CIR95CTD0427 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -2.50 |
| CIR95CTD0428 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -3.00 |
| CIR95CTD0429 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -3.50 |
| CIR95CTD0430 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -4.00 |
| CIR95CTD0431 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -4.50 |
| CIR95CTD0432 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -5.00 |
| CIR95CTD0433 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -5.50 |
| CIR95CTD0434 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -6.00 |
| CIR95CTD0435 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -6.50 |
| CIR95CTD0436 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -7.00 |
| CIR95CTD0437 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -7.50 |
| CIR95CTD0438 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -8.00 |
| CIR95CTD0439 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -8.50 |
| CIR95CTD0440 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -9.00 |
| CIR95CTD0441 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -9.50 |
| CIR95CTD0442 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -10.00 |
| CIR95CTD0443 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -10.50 |
| CIR95CTD0444 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -11.00 |
| CIR95CTD0445 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -11.50 |
| CIR95CTD0446 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -12.00 |
| CIR95CTD0447 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -12.50 |
| CIR95CTD0448 | EFORE-H | 2 | .NULL. | SAMP | WATER | 60 | 46 | 15.1 | 151 | 16 | 44 | 7/25/95 | 21:34 | -13.00 |
| CIR95CTD0015 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | 0.00 |
| CIR95CTD0016 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -0.50 |
| CIR95CTD0017 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -1.00 |
| CIR95CTD0018 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -1.50 |
| CIR95CTD0019 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -2.00 |
| CIR95CTD0020 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -2.50 |
| CIR95CTD0021 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -3.00 |
| CIR95CTD0022 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -3.50 |
| CIR95CTD0023 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -4.00 |
| CIR95CTD0024 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -4.50 |
| CIR95CTD0025 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -5.00 |
| CIR95CTD0026 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -5.50 |
| CIR95CTD0027 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -6.00 |
| CIR95CTD0028 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -6.50 |
| CIR95CTD0029 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -7.00 |
| CIR95CTD0030 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -7.50 |
| CIR95CTD0031 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -8.00 |
| CIR95CTD0032 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -8.50 |
| CIR95CTD0033 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -9.00 |
| CIR95CTD0034 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -9.50 |
| CIR95CTD0035 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -10.00 |
| CIR95CTD0036 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -10.50 |
| CIR95CTD0037 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -11.00 |
| CIR95CTD0038 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -11.50 |
| CIR95CTD0039 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -12.00 |
| CIR95CTD0040 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -12.50 |
| CIR95CTD0041 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -13.00 |
| CIR95CTD0042 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -13.50 |
| CIR95CTD0043 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -14.00 |
| CIR95CTD0044 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -14.50 |
| CIR95CTD0045 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -15.00 |
| CIR95CTD0046 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -15.50 |

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95CTD0047 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -16.00 |
| CIR95CTD0048 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -16.50 |
| CIR95DOX0001 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -1.50 |
| CIR95DOX0002 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -1.50 |
| CIR95NTU0001 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -1.50 |
| CIR95SAL0001 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:48 | -1.5 |
| CIR95SAL0002 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:48 | -1.5 |
| CIR95TMP0001 | KACHB-H | 1 | .NULL. | SAMP | WATER | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -1.50 |
| CIR95CTD0449 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -0.50 |
| CIR95CTD0450 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -1.00 |
| CIR95CTD0451 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -1.50 |
| CIR95CTD0452 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -2.00 |
| CIR95CTD0453 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -2.50 |
| CIR95CTD0454 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -3.00 |
| CIR95CTD0455 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -3.50 |
| CIR95CTD0456 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -4.00 |
| CIR95CTD0457 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -4.50 |
| CIR95CTD0458 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -5.00 |
| CIR95CTD0459 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -5.50 |
| CIR95CTD0460 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -6.00 |
| CIR95CTD0461 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -6.50 |
| CIR95CTD0462 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -7.00 |
| CIR95CTD0463 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -7.50 |
| CIR95CTD0464 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -8.00 |
| CIR95CTD0465 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -8.50 |
| CIR95CTD0466 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -9.00 |
| CIR95CTD0467 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -9.50 |
| CIR95CTD0468 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -10.00 |
| CIR95CTD0469 | KACHB-H | 2 | .NULL. | SAMP | WATER | 59 | 38 | 4.5 | 151 | 23 | 57.8 | 7/27/95 | 10:13 | -10.50 |
| CIR95CTD0049 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | 0.00 |
| CIR95CTD0050 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -0.50 |
| CIR95CTD0051 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -1.00 |
| CIR95CTD0052 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -1.50 |
| CIR95CTD0053 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -2.00 |
| CIR95CTD0054 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -2.50 |
| CIR95CTD0055 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -3.00 |
| CIR95CTD0056 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -3.50 |
| CIR95CTD0057 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -4.00 |
| CIR95CTD0058 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -4.50 |
| CIR95CTD0059 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -5.00 |
| CIR95CTD0060 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -5.50 |
| CIR95CTD0061 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -6.00 |
| CIR95CTD0062 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -6.50 |
| CIR95CTD0063 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -7.00 |
| CIR95CTD0064 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -7.50 |
| CIR95CTD0065 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -8.00 |
| CIR95CTD0066 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -8.50 |
| CIR95CTD0067 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -9.00 |
| CIR95CTD0068 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -9.50 |
| CIR95CTD0069 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -10.00 |
| CIR95CTD0070 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -10.50 |
| CIR95CTD0071 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -11.00 |
| CIR95CTD0072 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -11.50 |
| CIR95CTD0073 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -12.00 |
| CIR95CTD0074 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -12.50 |
| CIR95CTD0075 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -13.00 |
| CIR95CTD0076 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -13.50 |
| CIR95CTD0077 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -14.00 |
| CIR95CTD0078 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -14.50 |
| CIR95CTD0079 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -15.00 |
| CIR95CTD0080 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -15.50 |
| CIR95CTD0081 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -16.00 |
| CIR95CTD0082 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -16.50 |
| CIR95CTD0083 | KAMIB-H | 1 | .NULL. | SAMP | WATER | 59 | 22 | 36.4 | 153 | 46 | 0.6 | 6/21/95 | 11:11 | -17.00 |
| CIR95CTD0470 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -0.50 |
| CIR95CTD0471 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -1.00 |
| CIR95CTD0472 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -1.50 |
| CIR95CTD0473 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -2.00 |
| CIR95CTD0474 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -2.50 |
| CIR95CTD0475 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -3.00 |
| CIR95CTD0476 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -3.50 |
| CIR95CTD0477 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -4.00 |

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95CTD0478 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -4.50 |
| CIR95CTD0479 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -5.00 |
| CIR95CTD0480 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -5.50 |
| CIR95CTD0481 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -6.00 |
| CIR95CTD0482 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -6.50 |
| CIR95CTD0483 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -7.00 |
| CIR95CTD0484 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -7.50 |
| CIR95CTD0485 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -8.00 |
| CIR95CTD0486 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -8.50 |
| CIR95CTD0487 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -9.00 |
| CIR95CTD0488 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -9.50 |
| CIR95CTD0489 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -10.00 |
| CIR95CTD0490 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -10.50 |
| CIR95CTD0491 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -11.00 |
| CIR95CTD0492 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -11.50 |
| CIR95CTD0493 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -12.00 |
| CIR95CTD0494 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -12.50 |
| CIR95CTD0495 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -13.00 |
| CIR95CTD0496 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -13.50 |
| CIR95CTD0497 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -14.00 |
| CIR95CTD0498 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -14.50 |
| CIR95CTD0499 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -15.00 |
| CIR95CTD0500 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -15.50 |
| CIR95CTD0501 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -16.00 |
| CIR95CTD0502 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -16.50 |
| CIR95CTD0503 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -17.00 |
| CIR95CTD0504 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -17.50 |
| CIR95CTD0505 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -18.00 |
| CIR95DOX0005 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -1.00 |
| CIR95DOX0006 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -1.00 |
| CIR95SAL0005 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 33.6 | 153 | 46 | 13.9 | 7/29/95 | 17:09 | -1 |
| CIR95SAL0006 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 33.6 | 153 | 46 | 13.9 | 7/29/95 | 17:09 | -1 |
| CIR95TMP0003 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -1.00 |
| CIR95TMP0004 | KAMIB-H | 2 | .NULL. | SAMP | WATER | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -1.00 |
| CIR95CTD0084 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -0.50 |
| CIR95CTD0085 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -1.00 |
| CIR95CTD0086 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -1.50 |
| CIR95CTD0087 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -2.00 |
| CIR95CTD0088 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -2.50 |
| CIR95CTD0089 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -3.00 |
| CIR95CTD0090 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -3.50 |
| CIR95CTD0091 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -4.00 |
| CIR95CTD0092 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -4.50 |
| CIR95CTD0093 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -5.00 |
| CIR95CTD0094 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -5.50 |
| CIR95CTD0095 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -6.00 |
| CIR95CTD0096 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -6.50 |
| CIR95CTD0097 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -7.00 |
| CIR95CTD0098 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -7.50 |
| CIR95CTD0099 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -8.00 |
| CIR95CTD0100 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -8.50 |
| CIR95CTD0101 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -9.00 |
| CIR95CTD0102 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -9.50 |
| CIR95CTD0103 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -10.00 |
| CIR95CTD0104 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -10.50 |
| CIR95CTD0105 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -11.00 |
| CIR95CTD0106 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -11.50 |
| CIR95CTD0107 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -12.00 |
| CIR95CTD0108 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -12.50 |
| CIR95CTD0109 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -13.00 |
| CIR95CTD0110 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -13.50 |
| CIR95CTD0111 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -14.00 |
| CIR95CTD0112 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -14.50 |
| CIR95CTD0113 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -15.00 |
| CIR95CTD0114 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -15.50 |
| CIR95CTD0115 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -16.00 |
| CIR95CTD0116 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -16.50 |
| CIR95CTD0117 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -17.00 |
| CIR95CTD0118 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -17.50 |
| CIR95CTD0119 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -18.00 |
| CIR95CTD0120 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -18.50 |
| CIR95CTD0121 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -19.00 |

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95CTD0122 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -19.50 |
| CIR95CTD0123 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -20.00 |
| CIR95CTD0124 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -20.50 |
| CIR95CTD0125 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -21.00 |
| CIR95CTD0126 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -21.50 |
| CIR95CTD0127 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -22.00 |
| CIR95CTD0128 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -22.50 |
| CIR95CTD0129 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -23.00 |
| CIR95CTD0130 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -23.50 |
| CIR95CTD0131 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -24.00 |
| CIR95CTD0132 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -24.50 |
| CIR95CTD0133 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -25.00 |
| CIR95CTD0134 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -25.50 |
| CIR95CTD0135 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -26.00 |
| CIR95CTD0136 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -26.50 |
| CIR95CTD0137 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -27.00 |
| CIR95CTD0138 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -27.50 |
| CIR95CTD0139 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -28.00 |
| CIR95CTD0140 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -28.50 |
| CIR95CTD0141 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -29.00 |
| CIR95CTD0142 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -29.50 |
| CIR95CTD0143 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -30.00 |
| CIR95CTD0144 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -30.50 |
| CIR95CTD0145 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -31.00 |
| CIR95CTD0146 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -31.50 |
| CIR95CTD0147 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -32.00 |
| CIR95CTD0148 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -32.50 |
| CIR95CTD0149 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -33.00 |
| CIR95CTD0150 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -33.50 |
| CIR95CTD0151 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -34.00 |
| CIR95CTD0152 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -34.50 |
| CIR95CTD0153 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -35.00 |
| CIR95CTD0154 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -35.50 |
| CIR95CTD0155 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -36.00 |
| CIR95CTD0156 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -36.50 |
| CIR95CTD0157 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -37.00 |
| CIR95CTD0158 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -37.50 |
| CIR95CTD0159 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -38.00 |
| CIR95CTD0160 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -38.50 |
| CIR95CTD0161 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -39.00 |
| CIR95CTD0162 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -39.50 |
| CIR95CTD0163 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -40.00 |
| CIR95CTD0164 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -40.50 |
| CIR95CTD0165 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -41.00 |
| CIR95CTD0166 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -41.50 |
| CIR95CTD0167 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -42.00 |
| CIR95CTD0168 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -42.50 |
| CIR95CTD0169 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -43.00 |
| CIR95CTD0170 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -43.50 |
| CIR95CTD0171 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -44.00 |
| CIR95CTD0172 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -44.50 |
| CIR95CTD0173 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -45.00 |
| CIR95CTD0174 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -45.50 |
| CIR95CTD0175 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -46.00 |
| CIR95CTD0176 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -46.50 |
| CIR95CTD0177 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -47.00 |
| CIR95CTD0178 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -47.50 |
| CIR95CTD0179 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -48.00 |
| CIR95CTD0180 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -48.50 |
| CIR95CTD0181 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -49.00 |
| CIR95CTD0182 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -49.50 |
| CIR95CTD0183 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -50.00 |
| CIR95CTD0184 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -50.50 |
| CIR95CTD0185 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -51.00 |
| CIR95CTD0186 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -51.50 |
| CIR95CTD0187 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -52.00 |
| CIR95CTD0188 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -52.50 |
| CIR95CTD0189 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -53.00 |
| CIR95CTD0190 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -53.50 |
| CIR95CTD0191 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -54.00 |
| CIR95CTD0192 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -54.50 |
| CIR95CTD0193 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -55.00 |

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95CTD0194 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -55.50 |
| CIR95CTD0195 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -56.00 |
| CIR95CTD0196 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -56.50 |
| CIR95CTD0197 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -57.00 |
| CIR95CTD0198 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -57.50 |
| CIR95CTD0199 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -58.00 |
| CIR95CTD0200 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -58.50 |
| CIR95CTD0201 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -59.00 |
| CIR95CTD0202 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -59.50 |
| CIR95CTD0203 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -60.00 |
| CIR95CTD0204 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -60.50 |
| CIR95CTD0205 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -61.00 |
| CIR95CTD0206 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -61.50 |
| CIR95CTD0207 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -62.00 |
| CIR95CTD0208 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -62.50 |
| CIR95CTD0209 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -63.00 |
| CIR95CTD0210 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -63.50 |
| CIR95CTD0211 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -64.00 |
| CIR95CTD0212 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -64.50 |
| CIR95CTD0213 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -65.00 |
| CIR95CTD0214 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -65.50 |
| CIR95CTD0215 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -66.00 |
| CIR95CTD0216 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -66.50 |
| CIR95CTD0217 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -67.00 |
| CIR95CTD0218 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -67.50 |
| CIR95CTD0219 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -68.00 |
| CIR95CTD0220 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -68.50 |
| CIR95CTD0221 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -69.00 |
| CIR95CTD0222 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -69.50 |
| CIR95CTD0223 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -70.00 |
| CIR95CTD0224 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -70.50 |
| CIR95CTD0225 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -71.00 |
| CIR95CTD0226 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -71.50 |
| CIR95CTD0227 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -72.00 |
| CIR95CTD0228 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -72.50 |
| CIR95CTD0229 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -73.00 |
| CIR95CTD0230 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -73.50 |
| CIR95CTD0231 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -74.00 |
| CIR95CTD0232 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -74.50 |
| CIR95CTD0233 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -75.00 |
| CIR95CTD0234 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -75.50 |
| CIR95CTD0235 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -76.00 |
| CIR95CTD0236 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -76.50 |
| CIR95CTD0237 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -77.00 |
| CIR95CTD0238 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -77.50 |
| CIR95CTD0239 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -78.00 |
| CIR95CTD0240 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -78.50 |
| CIR95CTD0241 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -79.00 |
| CIR95CTD0242 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -79.50 |
| CIR95CTD0243 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -80.00 |
| CIR95CTD0244 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -80.50 |
| CIR95CTD0245 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -81.00 |
| CIR95CTD0246 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -81.50 |
| CIR95CTD0247 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -82.00 |
| CIR95CTD0248 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -82.50 |
| CIR95CTD0249 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -83.00 |
| CIR95CTD0250 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -83.50 |
| CIR95CTD0251 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -84.00 |
| CIR95CTD0252 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -84.50 |
| CIR95CTD0253 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -85.00 |
| CIR95CTD0254 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -85.50 |
| CIR95CTD0255 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -86.00 |
| CIR95CTD0256 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -86.50 |
| CIR95CTD0257 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -87.00 |
| CIR95CTD0258 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -87.50 |
| CIR95CTD0259 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -88.00 |
| CIR95CTD0260 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -88.50 |
| CIR95CTD0261 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -89.00 |
| CIR95CTD0262 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -89.50 |
| CIR95CTD0263 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -90.00 |
| CIR95CTD0264 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -90.50 |
| CIR95CTD0265 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -91.00 |

## Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95CTD0266 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -91.50 |
| CIR95CTD0267 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -92.00 |
| CIR95CTD0268 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -92.50 |
| CIR95CTD0269 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -93.00 |
| CIR95CTD0270 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -93.50 |
| CIR95CTD0271 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -94.00 |
| CIR95CTD0272 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -94.50 |
| CIR95CTD0273 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -95.00 |
| CIR95CTD0274 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -95.50 |
| CIR95CTD0275 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -96.00 |
| CIR95CTD0276 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -96.50 |
| CIR95CTD0277 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -97.00 |
| CIR95CTD0278 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -97.50 |
| CIR95CTD0279 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -98.00 |
| CIR95CTD0280 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -98.50 |
| CIR95CTD0281 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -99.00 |
| CIR95CTD0282 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -99.50 |
| CIR95CTD0283 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -100.0 |
| CIR95CTD0284 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -100.5 |
| CIR95CTD0285 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -101.0 |
| CIR95CTD0286 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -101.5 |
| CIR95CTD0287 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -102.0 |
| CIR95CTD0288 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -102.5 |
| CIR95CTD0289 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -103.0 |
| CIR95CTD0290 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -103.5 |
| CIR95CTD0291 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -104.0 |
| CIR95CTD0292 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -104.5 |
| CIR95CTD0293 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -105.0 |
| CIR95CTD0294 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -105.5 |
| CIR95CTD0295 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -106.0 |
| CIR95CTD0296 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -106.5 |
| CIR95CTD0297 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -107.0 |
| CIR95CTD0298 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -107.5 |
| CIR95CTD0299 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -108.0 |
| CIR95CTD0300 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -108.5 |
| CIR95CTD0301 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -109.0 |
| CIR95CTD0302 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -109.5 |
| CIR95CTD0303 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -110.0 |
| CIR95CTD0304 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -110.5 |
| CIR95CTD0305 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -111.0 |
| CIR95CTD0306 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -111.5 |
| CIR95CTD0307 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -112.0 |
| CIR95CTD0308 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -112.5 |
| CIR95CTD0309 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -113.0 |
| CIR95CTD0310 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -113.5 |
| CIR95CTD0311 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -114.0 |
| CIR95CTD0312 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -114.5 |
| CIR95CTD0313 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -115.0 |
| CIR95CTD0314 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -115.5 |
| CIR95CTD0315 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -116.0 |
| CIR95CTD0316 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -116.5 |
| CIR95CTD0317 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -117.0 |
| CIR95CTD0318 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -117.5 |
| CIR95CTD0319 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -118.0 |
| CIR95CTD0320 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -118.5 |
| CIR95CTD0321 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -119.0 |
| CIR95CTD0322 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -119.5 |
| CIR95CTD0323 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -120.0 |
| CIR95CTD0324 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -120.5 |
| CIR95CTD0325 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -121.0 |
| CIR95CTD0326 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -121.5 |
| CIR95CTD0327 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -122.0 |
| CIR95CTD0328 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -122.5 |
| CIR95CTD0329 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -123.0 |
| CIR95CTD0330 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -123.5 |
| CIR95CTD0331 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -124.0 |
| CIR95CTD0332 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -124.5 |
| CIR95CTD0333 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -125.0 |
| CIR95CTD0334 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -125.5 |
| CIR95CTD0335 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -126.0 |
| CIR95CTD0336 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -126.5 |
| CIR95CTD0337 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -127.0 |

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95CTD0338 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -127.5 |
| CIR95CTD0339 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -128.0 |
| CIR95CTD0340 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -128.5 |
| CIR95CTD0341 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -129.0 |
| CIR95CTD0342 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -129.5 |
| CIR95CTD0343 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -130.0 |
| CIR95CTD0344 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -130.5 |
| CIR95CTD0345 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -131.0 |
| CIR95CTD0346 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -131.5 |
| CIR95CTD0347 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -132.0 |
| CIR95CTD0348 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -132.5 |
| CIR95CTD0349 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -133.0 |
| CIR95CTD0350 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -133.5 |
| CIR95CTD0351 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -134.0 |
| CIR95CTD0352 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -134.5 |
| CIR95CTD0353 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -135.0 |
| CIR95CTD0354 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -135.5 |
| CIR95CTD0355 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -136.0 |
| CIR95CTD0356 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -136.5 |
| CIR95CTD0357 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -137.0 |
| CIR95CTD0358 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -137.5 |
| CIR95CTD0359 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -138.0 |
| CIR95CTD0360 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -138.5 |
| CIR95CTD0361 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -139.0 |
| CIR95CTD0362 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -139.5 |
| CIR95CTD0363 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -140.0 |
| CIR95CTD0364 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -140.5 |
| CIR95CTD0365 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -141.0 |
| CIR95CTD0366 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -141.5 |
| CIR95CTD0367 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -142.0 |
| CIR95CTD0368 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -142.5 |
| CIR95CTD0369 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -143.0 |
| CIR95CTD0370 | NULLZ-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 58.9 | 152 | 48 | 58.4 | 6/20/95 | 11:41 | -143.5 |
| CIR95CTD0371 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -1.50 |
| CIR95CTD0372 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -2.00 |
| CIR95CTD0373 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -2.50 |
| CIR95CTD0374 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -3.00 |
| CIR95CTD0375 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -3.50 |
| CIR95CTD0376 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -4.00 |
| CIR95CTD0377 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -4.50 |
| CIR95CTD0378 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -5.00 |
| CIR95CTD0379 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -5.50 |
| CIR95CTD0380 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -6.00 |
| CIR95CTD0381 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -6.50 |
| CIR95CTD0382 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -7.00 |
| CIR95CTD0383 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -7.50 |
| CIR95CTD0384 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -8.00 |
| CIR95CTD0385 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -8.50 |
| CIR95CTD0386 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -9.00 |
| CIR95CTD0387 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -9.50 |
| CIR95CTD0388 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -10.00 |
| CIR95CTD0389 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -10.50 |
| CIR95CTD0390 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -11.00 |
| CIR95CTD0391 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -11.50 |
| CIR95CTD0392 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -12.00 |
| CIR95CTD0393 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -12.50 |
| CIR95CTD0394 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -13.00 |
| CIR95CTD0395 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -13.50 |
| CIR95CTD0396 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -14.00 |
| CIR95CTD0397 | SEKAM-H | 1 | .NULL. | SAMP | WATER | 59 | 4 | 52.6 | 153 | 36 | 53.3 | 6/20/95 | 17:41 | -14.50 |
| CIR95CTD0398 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -1.50 |
| CIR95CTD0399 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -2.00 |
| CIR95CTD0400 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -2.50 |
| CIR95CTD0401 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -3.00 |
| CIR95CTD0402 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -3.50 |
| CIR95CTD0403 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -4.00 |
| CIR95CTD0404 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -4.50 |
| CIR95CTD0405 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -5.00 |
| CIR95CTD0406 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -5.50 |
| CIR95CTD0407 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -6.00 |
| CIR95CTD0408 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -6.50 |
| CIR95CTD0409 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -7.00 |

# Station and Sample Collection Data for Cook Inlet 1995 EMP

| Sample ID | Station | Survey | Rep | Type | Matrix | Latitude (N) | | | Longitude (W) | | | Date | Time (ADT) | Depth (M) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95CTD0410 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -7.50 |
| CIR95CTD0411 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -8.00 |
| CIR95CTD0412 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -8.50 |
| CIR95CTD0413 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -9.00 |
| CIR95CTD0414 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -9.50 |
| CIR95CTD0415 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -10.00 |
| CIR95CTD0416 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -10.50 |
| CIR95CTD0417 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -11.00 |
| CIR95CTD0418 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -11.50 |
| CIR95CTD0419 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -12.00 |
| CIR95CTD0420 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -12.50 |
| CIR95CTD0421 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -13.00 |
| CIR95CTD0422 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -13.50 |
| CIR95DOX0003 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -1.50 |
| CIR95DOX0004 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -1.50 |
| CIR95NTU0002 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -1.50 |
| CIR95SAL0003 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -0.5 |
| CIR95SAL0004 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -0.5 |
| CIR95TMP0002 | TRADB-H | 1 | .NULL. | SAMP | WATER | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -1.50 |
| CIR95CTD0506 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -0.50 |
| CIR95CTD0507 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -1.00 |
| CIR95CTD0508 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -1.50 |
| CIR95CTD0509 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -2.00 |
| CIR95CTD0510 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -2.50 |
| CIR95CTD0511 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -3.00 |
| CIR95CTD0512 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -3.50 |
| CIR95CTD0513 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -4.00 |
| CIR95CTD0514 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -4.50 |
| CIR95CTD0515 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -5.00 |
| CIR95CTD0516 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -5.50 |
| CIR95CTD0517 | TRADB-H | 2 | .NULL. | SAMP | WATER | 60 | 48 | 25.1 | 151 | 42 | 33.8 | 7/26/95 | 10:49 | -6.00 |

# APPENDIX B

## Sediment Results

### 1.0 PAH Data

# PAH Data for Cook Inlet 1995 EMP

| | Replicate 1 | | Replicate 2 | | Replicate 3 | |
|---|---|---|---|---|---|---|
| Station | EFORE-S | | EFORE-S | | EFORE-S | |
| Survey | 1 | | 1 | | 1 | |
| Replicate | 1 | | 2 | | 3 | |
| KLI Sample ID | CIR95PTT0010 | | CIR95PTT0011 | | CIR95PTT0012 | |
| Lab Sample ID | C21151 | | C21152 | | C21153 | |
| Matrix: | SEDIMENT | | SEDIMENT | | SEDIMENT | |
| Sample Type: | SAMP | | SAMP | | SAMP | |
| Batch: | M2338 | | M2338 | | M2338 | |
| Wet weight (g) | 30.06 | | 30.06 | | 30.07 | |
| Dry weight (g) | 20.80 | | 21.45 | | 23.61 | |
| Solids (%) | 69.2 | | 71.4 | | 78.5 | |

| ANALYTE (ng/g) | Value | Qual | Value | Qual | Value | Qual |
|---|---|---|---|---|---|---|
| Naphthalene | 2.5 | | 1.1 | | 0.7 | |
| C1-Naphthalenes | 5.4 | | 2.2 | | 1.3 | J |
| C2-Naphthalenes | 7.1 | | 0 | ND | 0 | ND |
| C3-Naphthalenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Naphthalenes | 0 | ND | 0 | ND | 0 | ND |
| Biphenyl | 1.3 | | 0.4 | | 0.3 | |
| Acenaphthylene | 0.4 | | 0.3 | J | 0.3 | J |
| Acenaphthene | 0.5 | | 0.8 | | 0.4 | |
| Fluorene | 1.1 | | 0.5 | | 0.3 | J |
| C1-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| Phenanthrene | 1.9 | | 0.5 | | 0.6 | |
| Anthracene | 0.5 | | 0.4 | | 0.2 | J |
| C1-Phen/Anthracenes | 3.3 | | 0 | ND | 0 | ND |
| C2-Phen/Anthracenes | 3.7 | | 0 | ND | 0 | ND |
| C3-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| Dibenzothiophene | 0.5 | | 0.6 | | 0.2 | J |
| C1-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| Fluoranthene | 0.6 | | 0.6 | | 0.2 | J |
| Pyrene | 0.7 | | 0.3 | | 0.3 | |
| C1-Fluoranthene/Pyrenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(a)anthracene | 0.2 | J | 0.1 | J | 0.1 | J |
| Chrysene | 0.5 | | 0.1 | J | 0.3 | |
| C1-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 0.5 | | 0.1 | J | 0.1 | J |
| Benzo(k)fluoranthene | 0.1 | J | 0.2 | | 0.0 | J |
| Benzo(e)pyrene | 0.4 | | 0.1 | J | 0.1 | J |
| Benzo(a)pyrene | 0.3 | | 0.1 | J | 0.2 | |
| Perylene | 3.5 | | 1.7 | J | 1.4 | J |
| Indeno(1,2,3-c,d)pyrene | 0.3 | | 0.1 | J | 0.1 | J |
| Dibenzo(a,h)anthracene | 0.2 | J | 0.2 | J | 0.1 | J |
| Benzo(g,h,i)perylene | 0.5 | | 0.1 | J | 0.1 | J |
| **TOTAL PAH** (ng/g) (Excluding Perylene) | **32.3** | | **8.8** | | **5.9** | |
| Specific Isomers (ng/g) | | | | | | |
| 1-Methylnaphthalene | 2.6 | | 0.8 | | 0.5 | J |
| 2-Methylnaphthalene | 2.8 | | 1.4 | | 0.9 | |
| 2,6-Dimethylnaphthalene | 1.5 | | 0.6 | | 0.8 | |
| 1,6,7-Trimethylnaphthalene | 1.6 | | 0.7 | | 0.4 | J |
| 1-Methylphenanthrene | 1.0 | | 0.6 | | 0.5 | |
| Surrogate Recoveries (%) | | | | | | |
| Naphthalene-d8 | 106.6 | | 99.4 | | 94.2 | |
| Acenapthene-d10 | 91.1 | | 118.3 | | 109.1 | |
| Phenanthrene-d10 | 119.1 | | 100.9 | | 91.2 | |
| Chrysene-d12 | 118.2 | | 111.0 | | 83.6 | |
| Perylene-d12 | 99.1 | | 95.1 | | 80.5 | |
| Total Hydrocarbon (THC in µg/g) | **4.0** | | **1.9** | | **3.6** | |

# PAH Data for Cook Inlet 1995 EMP

| Station | Survey | Replicate | KLI Sample ID | Lab Sample ID | Matrix | Sample Type | Batch | Wet weight (g) | Dry weight (g) | Solids (%) |
|---|---|---|---|---|---|---|---|---|---|---|
| KACHB-S | 1 | 1 | CIR95PTT0007 | C21148 | SEDIMENT | SAMP | M2338 | 30.08 | 15.78 | 52.5 |
| KACHB-S | 1 | 2 | CIR95PTT0008 | C21149 | SEDIMENT | SAMP | M2338 | 30.17 | 16.22 | 53.8 |
| KACHB-S | 1 | 3 | CIR95PTT0009 | C21150 | SEDIMENT | SAMP | M2338 | 30.03 | 17.13 | 57.0 |

| ANALYTE (ng/g) | Replicate 1 Value | Qual | Replicate 2 Value | Qual | Replicate 3 Value | Qual |
|---|---|---|---|---|---|---|
| Naphthalene | 2.8 | | 1.7 | | 2.3 | |
| C1-Naphthalenes | 1.9 | J | 4.0 | | 2.5 | |
| C2-Naphthalenes | 0 | ND | 7.6 | | 4.2 | |
| C3-Naphthalenes | 0 | ND | 0 | ND | 6.9 | |
| C4-Naphthalenes | 0 | ND | 0 | ND | 0 | ND |
| Biphenyl | 0.9 | | 0.7 | | 0.5 | |
| Acenaphthylene | 0.7 | | 0.4 | J | 0.2 | J |
| Acenaphthene | 1.5 | | 0.6 | | 0.7 | |
| Fluorene | 1.3 | | 0.7 | | 1.8 | |
| C1-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| Phenanthrene | 3.0 | | 2.5 | | 2.5 | |
| Anthracene | 0.4 | J | 0.4 | J | 0.3 | J |
| C1-Phen/Anthracenes | 9.0 | | 9.0 | | 8.0 | |
| C2-Phen/Anthracenes | 6.7 | | 6.4 | | 8.1 | |
| C3-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| Dibenzothiophene | 1.0 | | 0.8 | | 0.4 | J |
| C1-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| Fluoranthene | 3.9 | | 2.5 | | 2.6 | |
| Pyrene | 4.1 | | 2.4 | | 2.8 | |
| C1-Fluoranthene/Pyrenes | 7.5 | | 5.7 | | 7.2 | |
| Benzo(a)anthracene | 1.4 | | 0.6 | | 0.6 | |
| Chrysene | 1.6 | | 0.7 | | 1.3 | |
| C1-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 1.5 | | 0.7 | | 1.1 | |
| Benzo(k)fluoranthene | 0.5 | | 0.3 | | 0.3 | J |
| Benzo(e)pyrene | 1.0 | | 0.6 | | 0.7 | |
| Benzo(a)pyrene | 1.2 | | 0.4 | | 0.5 | |
| Perylene | 41.7 | | 45.6 | | 48.0 | |
| Indeno(1,2,3-c,d)pyrene | 0.7 | | 0.3 | | 0.5 | |
| Dibenzo(a,h)anthracene | 0.3 | J | 0.1 | J | 0.2 | J |
| Benzo(g,h,i)perylene | 1.5 | | 1.5 | | 1.7 | |
| **TOTAL PAH (ng/g)** (Excluding Perylene) | **54.4** | | **50.6** | | **57.7** | |

| Specific Isomers (ng/g) | Replicate 1 Value | Qual | Replicate 2 Value | Qual | Replicate 3 Value | Qual |
|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 0.9 | J | 1.7 | | 1.0 | J |
| 2-Methylnaphthalene | 1.1 | J | 2.3 | | 1.6 | |
| 2,6-Dimethylnaphthalene | 1.4 | | 2.4 | | 1.8 | |
| 1,6,7-Trimethylnaphthalene | 1.4 | | 1.3 | | 1.4 | |
| 1-Methylphenanthrene | 3.9 | | 2.3 | | 3.0 | |

| Surrogate Recoveries (%) | Replicate 1 | Replicate 2 | Replicate 3 |
|---|---|---|---|
| Naphthalene-d8 | 102.9 | 108.3 | 114.7 |
| Acenapthene-d10 | 98.3 | 108.5 | 109.6 |
| Phenanthrene-d10 | 107.4 | 101.0 | 107.0 |
| Chrysene-d12 | 110.3 | 107.2 | 107.9 |
| Perylene-d12 | 115.6 | 102.9 | 107.8 |
| **Total Hydrocarbon (THC in µg/g)** | **50.8** | **24.4** | **12.4** |

# PAH Data for Cook Inlet 1995 EMP

| | Replicate 1 | | Replicate 2 | | Replicate 3 | |
|---|---|---|---|---|---|---|
| Station | KAMIB-S | | KAMIB-S | | KAMIB-S | |
| Survey | 1 | | 1 | | 1 | |
| Replicate | 1 | | 2 | | 3 | |
| KLI Sample ID | CIR95PTT0004 | | CIR95PTT0005 | | CIR95PTT0006 | |
| Lab Sample ID | C21145 | | C21146 | | C21147 | |
| Matrix: | SEDIMENT | | SEDIMENT | | SEDIMENT | |
| Sample Type: | SAMP | | SAMP | | SAMP | |
| Batch: | M2338 | | M2338 | | M2338 | |
| Wet weight (g) | 30.04 | | 30.09 | | 30.18 | |
| Dry weight (g) | 20.65 | | 21.30 | | 22.46 | |
| Solids (%) | 68.8 | | 70.8 | | 74.4 | |
| **ANALYTE (ng/g)** | **Value** | **Qual** | **Value** | **Qual** | **Value** | **Qual** |
| Naphthalene | 2.4 | | 3.7 | | 2.2 | |
| C1-Naphthalenes | 7.2 | | 10.3 | | 3.9 | |
| C2-Naphthalenes | 7.0 | | 8.1 | | 4.7 | |
| C3-Naphthalenes | 0 | ND | 7.0 | | 4.8 | |
| C4-Naphthalenes | 0 | ND | 0 | ND | 0 | ND |
| Biphenyl | 1.1 | | 1.0 | | 1.3 | |
| Acenaphthylene | 0.3 | J | 0.2 | J | 0.4 | |
| Acenaphthene | 0.4 | J | 0.3 | J | 0.3 | J |
| Fluorene | 0.5 | | 0.9 | | 0.8 | |
| C1-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| Phenanthrene | 2.1 | | 2.7 | | 2.0 | |
| Anthracene | 0.4 | | 0.4 | | 0.1 | J |
| C1-Phen/Anthracenes | 3.2 | | 4.8 | | 2.8 | |
| C2-Phen/Anthracenes | 4.1 | | 5.4 | | 3.7 | |
| C3-Phen/Anthracenes | 0 | ND | 4.5 | | 0 | ND |
| C4-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| Dibenzothiophene | 0.4 | | 0.4 | | 0.4 | |
| C1-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| Fluoranthene | 0.6 | | 0.5 | | 0.5 | |
| Pyrene | 0.6 | | 0.7 | | 0.4 | |
| C1-Fluoranthene/Pyrenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(a)anthracene | 0.2 | J | 0.4 | | 0.2 | J |
| Chrysene | 0.8 | | 0.6 | | 0.4 | |
| C1-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 0.4 | | 0.4 | | 0.3 | |
| Benzo(k)fluoranthene | 0.1 | J | 0.2 | J | 0.1 | J |
| Benzo(e)pyrene | 0.3 | | 0.3 | | 0.2 | |
| Benzo(a)pyrene | 0.2 | J | 0.3 | | 0.2 | J |
| Perylene | 1.6 | J | 1.9 | J | 2.1 | |
| Indeno(1,2,3-c,d)pyrene | 0.2 | J | 0.2 | J | 0.1 | J |
| Dibenzo(a,h)anthracene | 0.1 | J | 0.1 | J | 0.1 | J |
| Benzo(g,h,i)perylene | 0.2 | | 0.4 | | 0.2 | |
| **TOTAL PAH (ng/g)** (Excluding Perylene) | **32.7** | | **53.7** | | **30.1** | |
| **Specific Isomers (ng/g)** | | | | | | |
| 1-Methylnaphthalene | 3.4 | | 5.3 | | 1.3 | |
| 2-Methylnaphthalene | 3.9 | | 5.0 | | 2.6 | |
| 2,6-Dimethylnaphthalene | 2.7 | | 3.6 | | 2.2 | |
| 1,6,7-Trimethylnaphthalene | 1.2 | | 1.3 | | 0.7 | |
| 1-Methylphenanthrene | 0.8 | | 1.8 | | 0.7 | |
| **Surrogate Recoveries (%)** | | | | | | |
| Naphthalene-d8 | 72.0 | | 109.0 | | 112.3 | |
| Acenapthene-d10 | 78.0 | | 99.9 | | 101.1 | |
| Phenanthrene-d10 | 88.9 | | 96.1 | | 109.3 | |
| Chrysene-d12 | 89.6 | | 90.0 | | 100.7 | |
| Perylene-d12 | 93.0 | | 103.0 | | 81.1 | |
| **Total Hydrocarbon (THC in µg/g)** | **2.1** | | **4.1** | | **9.4** | |

# PAH Data for Cook Inlet 1995 EMP

| | Replicate 1 | Replicate 2 | Replicate 3 |
|---|---|---|---|
| Station | NULLZ-S | NULLZ-S | NULLZ-S |
| Survey | 1 | 1 | 1 |
| Replicate | 1 | 2 | 3 |
| KLI Sample ID | CIR95PTT0001 | CIR95PTT0002 | CIR95PTT0003 |
| Lab Sample ID | C21142 | C21143 | C21144 |
| Matrix: | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Type: | SAMP | SAMP | SAMP |
| Batch: | M2338 | M2338 | M2338 |
| Wet weight (g) | 30.15 | 30.05 | 30.05 |
| Dry weight (g) | 19.63 | 20.11 | 20.07 |
| Solids (%) | 65.1 | 66.9 | 66.8 |

| ANALYTE (ng/g) | Value | Qual | Value | Qual | Value | Qual |
|---|---|---|---|---|---|---|
| Naphthalene | 3.3 | | 3.9 | | 3.6 | |
| C1-Naphthalenes | 10.7 | | 12.3 | | 11.5 | |
| C2-Naphthalenes | 15.7 | | 15.2 | | 16.8 | |
| C3-Naphthalenes | 17.1 | | 16.5 | | 19.5 | |
| C4-Naphthalenes | 0 | ND | 6.7 | | 6.9 | |
| Biphenyl | 1.7 | | 2.2 | | 1.8 | |
| Acenaphthylene | 0.4 | | 0.2 | J | 0.1 | J |
| Acenaphthene | 1.0 | | 0.6 | | 0.4 | J |
| Fluorene | 1.9 | | 2.4 | | 2.1 | |
| C1-Fluorenes | 3.8 | | 4.4 | | 4.5 | |
| C2-Fluorenes | 0 | ND | 9.5 | | 7.8 | |
| C3-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| Phenanthrene | 8.3 | | 7.2 | | 7.7 | |
| Anthracene | 0.2 | J | 0.4 | | 0.2 | J |
| C1-Phen/Anthracenes | 12.9 | | 7.4 | | 11.2 | |
| C2-Phen/Anthracenes | 10.3 | | 10.1 | | 12.6 | |
| C3-Phen/Anthracenes | 9.1 | | 4.2 | | 5.9 | |
| C4-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| Dibenzothiophene | 1.2 | | 1.1 | | 1.3 | |
| C1-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| Fluoranthene | 1.0 | | 1.0 | | 0.7 | |
| Pyrene | 1.1 | | 0.9 | | 1.0 | |
| C1-Fluoranthene/Pyrenes | 5.3 | | 4.7 | | 3.1 | |
| Benzo(a)anthracene | 0.3 | J | 0.4 | | 0.4 | |
| Chrysene | 1.5 | | 1.6 | | 1.5 | |
| C1-Chrysenes | 3.2 | | 4.4 | | 2.4 | |
| C2-Chrysenes | 3.1 | | 3.6 | | 3.6 | |
| C3-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 0.9 | | 0.9 | | 0.7 | |
| Benzo(k)fluoranthene | 0.1 | J | 0.1 | J | 0.1 | J |
| Benzo(e)pyrene | 0.7 | | 0.8 | | 0.7 | |
| Benzo(a)pyrene | 0.3 | | 0.3 | | 0.4 | |
| Perylene | 1.2 | J | 1.2 | J | 1.3 | J |
| Indeno(1,2,3-c,d)pyrene | 0.3 | | 0.3 | | 0.3 | |
| Dibenzo(a,h)anthracene | 0.1 | J | 0.2 | J | 0.2 | J |
| Benzo(g,h,i)perylene | 0.7 | | 0.7 | | 0.6 | |
| **TOTAL PAH** (ng/g) (Excluding Perylene) | 116.1 | | 123.9 | | 129.8 | |

| Specific Isomers (ng/g) | Replicate 1 | Replicate 2 | Replicate 3 |
|---|---|---|---|
| 1-Methylnaphthalene | 4.8 | 4.9 | 5.0 |
| 2-Methylnaphthalene | 5.9 | 7.4 | 6.5 |
| 2,6-Dimethylnaphthalene | 6.2 | 5.7 | 6.2 |
| 1,6,7-Trimethylnaphthalene | 2.3 | 4.3 | 2.1 |
| 1-Methylphenanthrene | 2.3 | 2.5 | 2.8 |

| Surrogate Recoveries (%) | Replicate 1 | Replicate 2 | Replicate 3 |
|---|---|---|---|
| Naphthalene-d8 | 71.2 | 94.0 | 54.2 |
| Acenapthene-d10 | 81.3 | 115.7 | 65.0 |
| Phenanthrene-d10 | 69.6 | 107.7 | 60.2 |
| Chrysene-d12 | 80.0 | 106.0 | 67.2 |
| Perylene-d12 | 86.8 | 91.6 | 100.8 |

| | Replicate 1 | Replicate 2 | Replicate 3 |
|---|---|---|---|
| Total Hydrocarbon (THC in µg/g) | 2.2 | 4.7 | 7.6 |

# PAH Data for Cook Inlet 1995 EMP

| | Replicate 1 | | Replicate 2 | | Replicate 3 | |
|---|---|---|---|---|---|---|
| Station | TRADB-S | | TRADB-S | | TRADB-S | |
| Survey | 1 | | 1 | | 1 | |
| Replicate | 1 | | 2 | | 3 | |
| KLI Sample ID | CIR95PTT0013 | | CIR95PTT0014 | | CIR95PTT0015 | |
| Lab Sample ID | C21154 | | C21155 | | C21156 | |
| Matrix: | SEDIMENT | | SEDIMENT | | SEDIMENT | |
| Sample Type: | SAMP | | SAMP | | SAMP | |
| Batch: | M2338 | | M2338 | | M2338 | |
| Wet weight (g) | 30.53 | | 30.28 | | 30.25 | |
| Dry weight (g) | 17.88 | | 18.14 | | 17.76 | |
| Solids (%) | 58.6 | | 59.9 | | 58.7 | |
| **ANALYTE (ng/g)** | **Value** | **Qual** | **Value** | **Qual** | **Value** | **Qual** |
| Naphthalene | 4.0 | | 3.7 | | 2.6 | |
| C1-Naphthalenes | 6.4 | | 9.9 | | 9.3 | |
| C2-Naphthalenes | 9.3 | | 12.5 | | 10.3 | |
| C3-Naphthalenes | 9.1 | | 0 | ND | 11.6 | |
| C4-Naphthalenes | 0 | ND | 0 | ND | 0 | ND |
| Biphenyl | 1.5 | | 1.0 | | 2.0 | |
| Acenaphthylene | 0.6 | | 0.1 | J | 0.3 | J |
| Acenaphthene | 0.5 | J | 0.4 | J | 1.4 | |
| Fluorene | 0.8 | | 0.6 | | 0.9 | |
| C1-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| Phenanthrene | 3.6 | | 3.7 | | 3.2 | |
| Anthracene | 1.0 | | 0.3 | J | 0.5 | |
| C1-Phen/Anthracenes | 5.2 | | 3.9 | | 5.5 | |
| C2-Phen/Anthracenes | 7.8 | | 7.2 | | 6.7 | |
| C3-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| Dibenzothiophene | 0.6 | | 0.9 | | 0.9 | |
| C1-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| Fluoranthene | 0.9 | | 1.0 | | 0.9 | |
| Pyrene | 1.1 | | 0.8 | | 0.9 | |
| C1-Fluoranthene/Pyrenes | 0 | ND | 0 | ND | 3.4 | |
| Benzo(a)anthracene | 0.1 | J | 0.2 | J | 0.5 | |
| Chrysene | 0.6 | | 1.0 | | 1.1 | |
| C1-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 0.5 | | 0.6 | | 0.6 | |
| Benzo(k)fluoranthene | 0.1 | J | 0.1 | J | 0.2 | J |
| Benzo(e)pyrene | 0.5 | | 0.3 | | 0.4 | |
| Benzo(a)pyrene | 0.2 | J | 0.3 | | 0.4 | |
| Perylene | 3.4 | | 2.9 | | 4.8 | |
| Indeno(1,2,3-c,d)pyrene | 0.2 | J | 0.2 | J | 0.3 | J |
| Dibenzo(a,h)anthracene | 0.1 | J | 0.1 | J | 0.1 | J |
| Benzo(g,h,i)perylene | 0.7 | | 0.4 | | 0.5 | |
| **TOTAL PAH (ng/g)** (Excluding Perylene) | **55.3** | | **49.2** | | **64.4** | |
| **Specific Isomers (ng/g)** | | | | | | |
| 1-Methylnaphthalene | 3.4 | | 4.7 | | 4.9 | |
| 2-Methylnaphthalene | 3.0 | | 5.2 | | 4.4 | |
| 2,6-Dimethylnaphthalene | 1.3 | | 1.5 | | 3.1 | |
| 1,6,7-Trimethylnaphthalene | 1.0 | | 0.9 | | 1.6 | |
| 1-Methylphenanthrene | 1.5 | | 1.3 | | 1.2 | |
| **Surrogate Recoveries (%)** | | | | | | |
| Naphthalene-d8 | 95.0 | | 47.8 | | 80.1 | |
| Acenapthene-d10 | 113.5 | | 81.2 | | 66.5 | |
| Phenanthrene-d10 | 90.5 | | 58.1 | | 84.1 | |
| Chrysene-d12 | 113.0 | | 68.4 | | 70.4 | |
| Perylene-d12 | 110.3 | | 103.3 | | 78.1 | |
| **Total Hydrocarbon (THC in µg/g)** | **4.5** | | **2.3** | | **2.5** | |

# APPENDIX B

Sediment Results

## 2.0 PAH Data for Sediment Intercalibration

# PAH Data for Cook Inlet 1995 EMP

| Station | Survey | Replicate | KLI Sample ID | Lab Sample ID |
|---|---|---|---|---|
| EFORE-S | ADL | N/A | RCAC9417000R | C20988 |
| EFORE-S | ADL | N/A | RCAC9417000Rs | C20988s |

| | RCAC9417000R / C20988 | RCAC9417000Rs / C20988s |
|---|---|---|
| Matrix: | SEDIMENT | SEDIMENT |
| Sample Type: | SAMP | SONICATE |
| Batch: | M2328 | M2337 |
| Wet weight (g) | 15.09 | 15.12 |
| Dry weight (g) | 10.44 | 10.51 |
| Solids (%) | 69.2 | 69.5 |

| ANALYTE (ng/g) | Value | Qual | Value | Qual |
|---|---|---|---|---|
| Naphthalene | 4.6 | | 4.6 | |
| C1-Naphthalenes | 6.7 | | 8.9 | |
| C2-Naphthalenes | 7.9 | | 7.8 | |
| C3-Naphthalenes | 9.4 | | 9.2 | |
| C4-Naphthalenes | 10.0 | | 0 | ND |
| Biphenyl | 1.5 | | 2.1 | |
| Acenaphthylene | 0.2 | J | 0.5 | J |
| Acenaphthene | 0.5 | J | 1.0 | |
| Fluorene | 1.0 | | 1.8 | |
| C1-Fluorenes | 2.1 | | 0 | ND |
| C2-Fluorenes | 3.8 | | 0 | ND |
| C3-Fluorenes | 6.3 | | 0 | ND |
| Phenanthrene | 3.3 | | 7.5 | |
| Anthracene | 0.3 | J | 1.0 | |
| C1-Phen/Anthracenes | 5.3 | | 10.1 | |
| C2-Phen/Anthracenes | 7.7 | | 13.3 | |
| C3-Phen/Anthracenes | 9.6 | | 0 | ND |
| C4-Phen/Anthracenes | 8.3 | | 0 | ND |
| Dibenzothiophene | 0.8 | | 2.3 | |
| C1-Dibenzothiophenes | 1.6 | | 0 | ND |
| C2-Dibenzothiophenes | 1.6 | | 0 | ND |
| C3-Dibenzothiophenes | 1.7 | | 0 | ND |
| Fluoranthene | 0.8 | | 1.8 | |
| Pyrene | 1.1 | | 2.8 | |
| C1-Fluoranthene/Pyrenes | 2.8 | | 4.1 | |
| Benzo(a)anthracene | 0.3 | J | 2.7 | |
| Chrysene | 1.2 | | 1.4 | |
| C1-Chrysenes | 1.3 | | 0 | ND |
| C2-Chrysenes | 8.8 | | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 0.9 | | 1.3 | |
| Benzo(k)fluoranthene | 0.1 | J | 0.2 | J |
| Benzo(e)pyrene | 0.7 | | 1.0 | |
| Benzo(a)pyrene | 0.4 | J | 0.5 | |
| Perylene | 8.2 | | 16.1 | |
| Indeno(1,2,3-c,d)pyrene | 0.3 | J | 0.4 | J |
| Dibenzo(a,h)anthracene | 0.2 | J | 0.4 | J |
| Benzo(g,h,i)perylene | 1.1 | | 1.2 | |
| **TOTAL PAH** (ng/g) (Excluding Perylene) | **113.8** | | **88.1** | |

| Specific Isomers (ng/g) | | |
|---|---|---|
| 1-Methylnaphthalene | 2.8 | 4.8 |
| 2-Methylnaphthalene | 3.9 | 4.2 |
| 2,6-Dimethylnaphthalene | 2.6 | 3.9 |
| 1,6,7-Trimethylnaphthalene | 1.2 | 2.6 |
| 1-Methylphenanthrene | 1.2 | 3.0 |
| **Surrogate Recoveries (%)** | | |
| Naphthalene-d8 | 95.3 | 107.1 |
| Acenapthene-d10 | 95.1 | 91.5 |
| Phenanthrene-d10 | 93.9 | 87.5 |
| Chrysene-d12 | 100.8 | 114.8 |
| Perylene-d12 | 74.0 | 76.2 |
| Total Hydrocarbon (THC in µg/g) | N/A | N/A |

# PAH Data for Cook Inlet 1995 EMP

| | Sample 1 | | Sample 2 | |
|---|---|---|---|---|
| Station | TRADB-S | | TRADB-S | |
| Survey | ADL | | ADL | |
| Replicate | N/A | | N/A | |
| KLI Sample ID | RCAC940500OR | | RCAC940500ORs | |
| Lab Sample ID | C20989 | | C20989s | |
| Matrix: | SEDIMENT | | SEDIMENT | |
| Sample Type: | SAMP | | SONICATE | |
| Batch: | M2328 | | M2337 | |
| Wet weight (g) | 15.14 | | 15.12 | |
| Dry weight (g) | 8.87 | | 8.66 | |
| Solids (%) | 58.6 | | 57.3 | |
| **ANALYTE (ng/g)** | **Value** | **Qual** | **Value** | **Qual** |
| Naphthalene | 5.8 | | 6.8 | |
| C1-Naphthalenes | 7.9 | | 11.7 | |
| C2-Naphthalenes | 9.3 | | 16.0 | |
| C3-Naphthalenes | 8.3 | | 0 | ND |
| C4-Naphthalenes | 9.0 | | 0 | ND |
| Biphenyl | 1.8 | | 1.8 | |
| Acenaphthylene | 0.2 | J | 0.6 | J |
| Acenaphthene | 0.3 | J | 0.7 | J |
| Fluorene | 0.8 | J | 1.0 | J |
| C1-Fluorenes | 2.2 | | 0 | ND |
| C2-Fluorenes | 4.4 | | 0 | ND |
| C3-Fluorenes | 12.1 | | 0 | ND |
| Phenanthrene | 4.5 | | 7.0 | |
| Anthracene | 0.3 | J | 1.1 | |
| C1-Phen/Anthracenes | 6.6 | | 9.9 | |
| C2-Phen/Anthracenes | 6.6 | | 10.9 | |
| C3-Phen/Anthracenes | 7.1 | | 9.7 | |
| C4-Phen/Anthracenes | 5.0 | | 0 | ND |
| Dibenzothiophene | 1.3 | | 1.1 | |
| C1-Dibenzothiophenes | 2.6 | | 0 | ND |
| C2-Dibenzothiophenes | 2.7 | | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND | 0 | ND |
| Fluoranthene | 1.0 | | 1.7 | |
| Pyrene | 1.5 | | 2.1 | |
| C1-Fluoranthene/Pyrenes | 2.9 | | 0 | ND |
| Benzo(a)anthracene | 0.4 | J | 0.9 | |
| Chrysene | 1.4 | | 1.3 | |
| C1-Chrysenes | 2.0 | | 0 | ND |
| C2-Chrysenes | 4.4 | | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 1.2 | | 1.1 | |
| Benzo(k)fluoranthene | 0.2 | J | 0.2 | J |
| Benzo(e)pyrene | 0.9 | | 0.9 | |
| Benzo(a)pyrene | 0.5 | J | 0.5 | J |
| Perylene | 7.1 | | 12.4 | |
| Indeno(1,2,3-c,d)pyrene | 0.4 | J | 0.4 | J |
| Dibenzo(a,h)anthracene | 0.2 | J | 0.2 | J |
| Benzo(g,h,i)perylene | 1.6 | | 1.5 | |
| **TOTAL PAH (ng/g)** (Excluding Perylene) | **117.3** | | **89.0** | |
| **Specific Isomers (ng/g)** | | | | |
| 1-Methylnaphthalene | 3.2 | | 6.5 | |
| 2-Methylnaphthalene | 4.7 | | 5.3 | |
| 2,6-Dimethylnaphthalene | 3.8 | | 4.4 | |
| 1,6,7-Trimethylnaphthalene | 2.9 | | 1.9 | |
| 1-Methylphenanthrene | 1.6 | | 3.2 | |
| **Surrogate Recoveries (%)** | | | | |
| Naphthalene-d8 | 104.5 | | 81.3 | |
| Acenapthene-d10 | 104.9 | | 107.5 | |
| Phenanthrene-d10 | 95.2 | | 95.4 | |
| Chrysene-d12 | 97.0 | | 103.2 | |
| Perylene-d12 | 86.0 | | 77.0 | |
| Total Hydrocarbon (THC in µg/g) | N/A | | N/A | |

# PAH Data for Cook Inlet 1995 EMP

| | Sample 1 | Sample 2 |
|---|---|---|
| Station | TRADB-S | TRADB-S |
| Survey | ADL | ADL |
| Replicate | N/A | N/A |
| KLI Sample ID | RCAC940600OR | RCAC940600ORs |
| Lab Sample ID | C20990 | C20990s |
| Matrix: | SEDIMENT | SEDIMENT |
| Sample Type: | SAMP | SONICATE |
| Batch: | M2328 | M2337 |
| Wet weight (g) | 15.11 | 15.21 |
| Dry weight (g) | 7.91 | 8.08 |
| Solids (%) | 52.3 | 53.1 |

| ANALYTE (ng/g) | Value | Qual | Value | Qual |
|---|---|---|---|---|
| Naphthalene | 6.0 | | 4.4 | |
| C1-Naphthalenes | 8.3 | | 9.8 | |
| C2-Naphthalenes | 7.7 | | 18.3 | |
| C3-Naphthalenes | 13.2 | | 0 | ND |
| C4-Naphthalenes | 8.3 | | 0 | ND |
| Biphenyl | 1.6 | | 1.7 | |
| Acenaphthylene | 0.3 | J | 1.0 | |
| Acenaphthene | 0.6 | J | 0.9 | J |
| Fluorene | 1.2 | | 2.4 | |
| C1-Fluorenes | 2.5 | | 0 | ND |
| C2-Fluorenes | 5.3 | | 0 | ND |
| C3-Fluorenes | 8.5 | | 0 | ND |
| Phenanthrene | 4.1 | | 5.7 | |
| Anthracene | 0.4 | J | 0.6 | J |
| C1-Phen/Anthracenes | 5.1 | | 8.1 | |
| C2-Phen/Anthracenes | 4.6 | | 10.4 | |
| C3-Phen/Anthracenes | 6.8 | | 0 | ND |
| C4-Phen/Anthracenes | 4.3 | | 0 | ND |
| Dibenzothiophene | 1.1 | | 0.9 | J |
| C1-Dibenzothiophenes | 1.5 | J | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND | 0 | ND |
| Fluoranthene | 1.5 | | 1.0 | |
| Pyrene | 1.6 | | 2.3 | |
| C1-Fluoranthene/Pyrenes | 3.3 | | 0 | ND |
| Benzo(a)anthracene | 0.6 | J | 0.8 | |
| Chrysene | 1.2 | | 1.5 | |
| C1-Chrysenes | 1.9 | | 0 | ND |
| C2-Chrysenes | 3.6 | | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 1.3 | | 1.1 | |
| Benzo(k)fluoranthene | 0.3 | J | 0.2 | J |
| Benzo(e)pyrene | 0.8 | | 1.2 | |
| Benzo(a)pyrene | 0.6 | | 0.5 | J |
| Perylene | 5.3 | | 9.3 | |
| Indeno(1,2,3-c,d)pyrene | 0.6 | | 0.4 | J |
| Dibenzo(a,h)anthracene | 0.2 | J | 0.5 | J |
| Benzo(g,h,i)perylene | 1.6 | | 1.1 | |
| TOTAL PAH (ng/g) (Excluding Perylene) | 110.4 | | 74.5 | |

| Specific Isomers (ng/g) | | |
|---|---|---|
| 1-Methylnaphthalene | 3.5 | 4.3 |
| 2-Methylnaphthalene | 4.8 | 5.5 |
| 2,6-Dimethylnaphthalene | 4.1 | 6.6 |
| 1,6,7-Trimethylnaphthalene | 1.7 | 3.7 |
| 1-Methylphenanthrene | 1.2 | 2.0 |

| Surrogate Recoveries (%) | | |
|---|---|---|
| Naphthalene-d8 | 99.0 | 76.5 |
| Acenapthene-d10 | 100.4 | 76.6 |
| Phenanthrene-d10 | 103.6 | 86.4 |
| Chrysene-d12 | 103.4 | 89.3 |
| Perylene-d12 | 74.3 | 92.0 |

| Total Hydrocarbon (THC in µg/g) | N/A | N/A |
|---|---|---|

# APPENDIX B

## Sediment Results

## 3.0 PAH Quality Control Data

# PAH Data for Cook Inlet 1995 EMP

| | Sample 1 | Sample 2 |
|---|---|---|
| Station | TRADB-S | TRADB-S |
| Survey | 1 | 1 |
| Replicate | EB | EB |
| KLI Sample ID | CIR95PTB0002 | CIR95PTB0002 |
| Lab Sample ID | C21159 | C21160 |
| Matrix: | WATER | WATER |
| Sample Type: | EQUIP. BLANK | EQUIP. BLANK |
| Batch: | M2336 | M2336 |
| Wet weight (g) | N/A | N/A |
| Dry weight (g) | N/A | N/A |
| Solids (%) | N/A | N/A |

| ANALYTE (ng/g) | Value | Qual | Value | Qual |
|---|---|---|---|---|
| Naphthalene | 1.2 | J | 1.5 | J |
| C1-Naphthalenes | 0.5 | J | 0.7 | J |
| C2-Naphthalenes | 0 | ND | 0 | ND |
| C3-Naphthalenes | 0 | ND | 0 | ND |
| C4-Naphthalenes | 0 | ND | 0 | ND |
| Biphenyl | 0.2 | J | 0.3 | J |
| Acenaphthylene | 0.1 | J | 0 | ND |
| Acenaphthene | 0.3 | J | 0.3 | J |
| Fluorene | 0.2 | J | 0.2 | J |
| C1-Fluorenes | 0 | ND | 0 | ND |
| C2-Fluorenes | 0 | ND | 0 | ND |
| C3-Fluorenes | 0 | ND | 0 | ND |
| Phenanthrene | 0.3 | J | 0.4 | J |
| Anthracene | 0.2 | J | 0.2 | J |
| C1-Phen/Anthracenes | 0 | ND | 0 | ND |
| C2-Phen/Anthracenes | 0 | ND | 0 | ND |
| C3-Phen/Anthracenes | 0 | ND | 0 | ND |
| C4-Phen/Anthracenes | 0 | ND | 0 | ND |
| Dibenzothiophene | 0.3 | J | 0.4 | J |
| C1-Dibenzothiophenes | 0 | ND | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND | 0 | ND |
| Fluoranthene | 0.1 | J | 0.2 | J |
| Pyrene | 0.2 | J | 0.2 | J |
| C1-Fluoranthene/Pyrenes | 0 | ND | 0 | ND |
| Benzo(a)anthracene | 0.1 | J | 0 | ND |
| Chrysene | 0.1 | J | 0.1 | J |
| C1-Chrysenes | 0 | ND | 0 | ND |
| C2-Chrysenes | 0 | ND | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 0 | ND | 0.1 | J |
| Benzo(k)fluoranthene | 0 | ND | 0 | ND |
| Benzo(e)pyrene | 0 | ND | 0.1 | J |
| Benzo(a)pyrene | 0.1 | J | 0 | ND |
| Perylene | 0 | ND | 0.1 | J |
| Indeno(1,2,3-c,d)pyrene | 0.1 | J | 0 | ND |
| Dibenzo(a,h)anthracene | 0 | ND | 0 | ND |
| Benzo(g,h,i)perylene | 0.1 | J | 0.1 | J |
| **TOTAL PAH (ng/g)** (Excluding Perylene) | **4.1** | | **4.7** | |

| Specific Isomers (ng/g) | Value | Qual | Value | Qual |
|---|---|---|---|---|
| 1-Methylnaphthalene | 0.4 | J | 0.3 | J |
| 2-Methylnaphthalene | 0.2 | J | 0.4 | J |
| 2,6-Dimethylnaphthalene | 0.3 | J | 0.1 | J |
| 1,6,7-Trimethylnaphthalene | 0.1 | J | 0.6 | J |
| 1-Methylphenanthrene | 0.1 | J | 0.1 | J |

| Surrogate Recoveries (%) | Value | Value |
|---|---|---|
| Naphthalene-d8 | 102.1 | 86.8 |
| Acenapthene-d10 | 96.1 | 89.6 |
| Phenanthrene-d10 | 86.5 | 89.1 |
| Chrysene-d12 | 85.3 | 77.5 |
| Perylene-d12 | 94.0 | 82.5 |

| | Value | Value |
|---|---|---|
| Total Hydrocarbon (THC in µg/g) | 1.0 < | 1.0 < |

# PAH Data for Cook Inlet 1995 EMP

| | Sample 1 | Sample 2 |
|---|---|---|
| Station | TRADB-S | TRADB-S |
| Survey | 1 | 1 |
| Replicate | FB | FB |
| KLI Sample ID | CIR95PTB0001 | CIR95PTB0001 |
| Lab Sample ID | C21157 | C21158 |
| Matrix: | WATER | WATER |
| Sample Type: | FIELD BLANK | FIELD BLANK |
| Batch: | M2336 | M2336 |
| Wet weight (g) | N/A | N/A |
| Dry weight (g) | N/A | N/A |
| Solids (%) | N/A | N/A |

| ANALYTE (ng/g) | Value | Qual | Value | Qual |
|---|---|---|---|---|
| Naphthalene | 1.7 | J | 1.7 | J |
| C1-Naphthalenes | 0.7 | J | 0.6 | J |
| C2-Naphthalenes | 0 | ND | 0 | ND |
| C3-Naphthalenes | 0 | ND | 0 | ND |
| C4-Naphthalenes | 0 | ND | 0 | ND |
| Biphenyl | 0.3 | J | 0.3 | J |
| Acenaphthylene | 0.1 | J | 0.1 | J |
| Acenaphthene | 0.2 | J | 0.5 | J |
| Fluorene | 0.3 | J | 0.2 | J |
| C1-Fluorenes | 0 | ND | 0 | ND |
| C2-Fluorenes | 0 | ND | 0 | ND |
| C3-Fluorenes | 0 | ND | 0 | ND |
| Phenanthrene | 0.4 | J | 0.5 | J |
| Anthracene | 0.2 | J | 0.2 | J |
| C1-Phen/Anthracenes | 0 | ND | 0 | ND |
| C2-Phen/Anthracenes | 0 | ND | 0 | ND |
| C3-Phen/Anthracenes | 0 | ND | 0 | ND |
| C4-Phen/Anthracenes | 0 | ND | 0 | ND |
| Dibenzothiophene | 0.4 | J | 0.3 | J |
| C1-Dibenzothiophenes | 0 | ND | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND | 0 | ND |
| Fluoranthene | 0.2 | J | 0.2 | J |
| Pyrene | 0.2 | J | 0.1 | J |
| C1-Fluoranthene/Pyrenes | 0 | ND | 0 | ND |
| Benzo(a)anthracene | 0.1 | J | 0.1 | J |
| Chrysene | 0.1 | J | 0.1 | J |
| C1-Chrysenes | 0 | ND | 0 | ND |
| C2-Chrysenes | 0 | ND | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 0 | ND | 0 | ND |
| Benzo(k)fluoranthene | 0.1 | J | 0.1 | J |
| Benzo(e)pyrene | 0 | ND | 0 | ND |
| Benzo(a)pyrene | 0 | ND | 0.2 | J |
| Perylene | 0.1 | J | 0 | ND |
| Indeno(1,2,3-c,d)pyrene | 0.1 | J | 0 | ND |
| Dibenzo(a,h)anthracene | 0.1 | J | 0 | ND |
| Benzo(g,h,i)perylene | 0 | ND | 0.1 | J |
| **TOTAL PAH (ng/g)** (Excluding Perylene) | **5.1** | | **5.2** | |

| Specific Isomers (ng/g) | Value | Qual | Value | Qual |
|---|---|---|---|---|
| 1-Methylnaphthalene | 0.3 | J | 0.4 | J |
| 2-Methylnaphthalene | 0.4 | J | 0.2 | J |
| 2,6-Dimethylnaphthalene | 0.2 | J | 0.2 | J |
| 1,6,7-Trimethylnaphthalene | 0.3 | J | 0.2 | J |
| 1-Methylphenanthrene | 0.1 | J | 0.1 | J |

| Surrogate Recoveries (%) | Sample 1 | Sample 2 |
|---|---|---|
| Naphthalene-d8 | 90.9 | 95.9 |
| Acenapthene-d10 | 88.4 | 102.4 |
| Phenanthrene-d10 | 84.1 | 96.0 |
| Chrysene-d12 | 84.6 | 90.7 |
| Perylene-d12 | 85.7 | 88.2 |

| | Sample 1 | Sample 2 |
|---|---|---|
| Total Hydrocarbon (THC in µg/g) | 1.0 < | 1.0 < |

# PAH Quality Control Data for Cook Inlet 1995 EMP

| QC Sample Type | Lab Sample ID | QC Sample Type | Lab Sample ID |
|---|---|---|---|
| MATRIX SPIKE | Q12323 | MATRIX SPIKE DUPE | Q12324 |

**ASSOCIATED SAMPLE INFORMATION**

| Station | Survey | Rep | KLI Sample ID |
|---|---|---|---|
| EFORE-S | .NULL. | .NULL. | RCAC941700OR |
| EFORE-S | .NULL. | .NULL. | RCAC941700OR |

| | MATRIX SPIKE (Q12323) | MATRIX SPIKE DUPE (Q12324) |
|---|---|---|
| Matrix: | SEDIMENT | SEDIMENT |
| Sample Type: | SAMP | SAMP |
| Batch: | M2328 | M2328 |
| Wet weight (g) | 15 | 15.02 |
| Dry weight (g) | 10.22 | 10.3 |
| Solids (%) | 68.1 | 68.5 |

| ANALYTE (ng/g) | Value | Qual | Value | Qual |
|---|---|---|---|---|
| Naphthalene | 76.6 | | 88.6 | |
| C1-Naphthalenes | .NULL. | | .NULL. | |
| C2-Naphthalenes | .NULL. | | .NULL. | |
| C3-Naphthalenes | .NULL. | | .NULL. | |
| C4-Naphthalenes | .NULL. | | .NULL. | |
| Biphenyl | 100.8 | | 101 | |
| Acenaphthylene | 99.7 | | 104.4 | |
| Acenaphthene | 103.1 | | 103.2 | |
| Fluorene | 98.5 | | 100.9 | |
| C1-Fluorenes | .NULL. | | .NULL. | |
| C2-Fluorenes | .NULL. | | .NULL. | |
| C3-Fluorenes | .NULL. | | .NULL. | |
| Phenanthrene | 106.7 | | 106.9 | |
| Anthracene | 87.3 | | 90.3 | |
| C1-Phen/Anthracenes | .NULL. | | .NULL. | |
| C2-Phen/Anthracenes | .NULL. | | .NULL. | |
| C3-Phen/Anthracenes | .NULL. | | .NULL. | |
| C4-Phen/Anthracenes | .NULL. | | .NULL. | |
| Dibenzothiophene | 101.5 | | 97.1 | |
| C1-Dibenzothiophenes | .NULL. | | .NULL. | |
| C2-Dibenzothiophenes | .NULL. | | .NULL. | |
| C3-Dibenzothiophenes | .NULL. | | .NULL. | |
| Fluoranthene | 88.5 | | 89.6 | |
| Pyrene | 77.1 | | 81.8 | |
| C1-Fluoranthene/Pyrenes | .NULL. | | .NULL. | |
| Benzo(a)anthracene | 98.4 | | 107 | |
| Chrysene | 97.6 | | 97.9 | |
| C1-Chrysenes | .NULL. | | .NULL. | |
| C2-Chrysenes | .NULL. | | .NULL. | |
| C3-Chrysenes | .NULL. | | .NULL. | |
| C4-Chrysenes | .NULL. | | .NULL. | |
| Benzo(b)fluoranthene | 116.8 | | 134 | Q |
| Benzo(k)fluoranthene | 112.4 | | 111.7 | |
| Benzo(e)pyrene | 106.9 | | 114.3 | |
| Benzo(a)pyrene | 108.5 | | 121.9 | Q |
| Perylene | 85 | | 89.1 | |
| Indeno(1,2,3-c,d)pyrene | 112.3 | | 111.2 | |
| Dibenzo(a,h)anthracene | 106.8 | | 109.6 | |
| Benzo(g,h,i)perylene | 112.7 | | 109.9 | |
| **TOTAL PAH (ng/g)** (Excluding Perylene) | **98.5** | | **102.4** | |

| Specific Isomers (ng/g) | | |
|---|---|---|
| 1-Methylnaphthalene | 99.1 | 94.7 |
| 2-Methylnaphthalene | 88.5 | 84.7 |
| 2,6-Dimethylnaphthalene | 100.1 | 106.5 |
| 1,6,7-Trimethylnaphthalene | 84.2 | 107.5 |
| 1-Methylphenanthrene | 94.2 | 96.5 |

| Surrogate Recoveries (%) | | |
|---|---|---|
| Naphthalene-d8 | 105.3 | 100.5 |
| Acenapthene-d10 | 100.9 | 95.1 |
| Phenanthrene-d10 | 100.9 | 97.1 |
| Chrysene-d12 | 97.4 | 94.7 |
| Perylene-d12 | 92.6 | 88.4 |

| | | |
|---|---|---|
| Total Hydrocarbon (THC in µg/g) | N/A | N/A |

# PAH Quality Control Data for Cook Inlet 1995 EMP

| QC Sample Type | Lab Sample ID | QC Sample Type | Lab Sample ID |
|---|---|---|---|
| MATRIX SPIKE | Q12408 | MATRIX SPIKE DUPE | Q12409 |

**ASSOCIATED SAMPLE INFORMATION**

| Station | Survey | Rep | KLI Sample ID | Station | Survey | Rep | KLI Sample ID |
|---|---|---|---|---|---|---|---|
| TRADB-S | .NULL. | .NULL. | RCAC940600ORs | TRADB-S | .NULL. | .NULL. | RCAC940600ORs |

| | Matrix Spike | Matrix Spike Dupe |
|---|---|---|
| Matrix: | SEDIMENT | SEDIMENT |
| Sample Type: | SONICATE | SONICATE |
| Batch: | M2337 | M2337 |
| Wet weight (g) | 15.08 | 15.14 |
| Dry weight (g) | 7.98 | 7.86 |
| Solids (%) | 52.9 | 51.9 |

| ANALYTE (ng/g) | Value | Qual | Value | Qual |
|---|---|---|---|---|
| Naphthalene | 80.7 | | 75.5 | |
| C1-Naphthalenes | .NULL. | | .NULL. | |
| C2-Naphthalenes | .NULL. | | .NULL. | |
| C3-Naphthalenes | .NULL. | | .NULL. | |
| C4-Naphthalenes | .NULL. | | .NULL. | |
| Biphenyl | 115.3 | | 107.1 | |
| Acenaphthylene | 96.8 | | 79.2 | |
| Acenaphthene | 112.8 | | 90.1 | |
| Fluorene | 121.5 | Q | 105.6 | |
| C1-Fluorenes | .NULL. | | .NULL. | |
| C2-Fluorenes | .NULL. | | .NULL. | |
| C3-Fluorenes | .NULL. | | .NULL. | |
| Phenanthrene | 113.3 | | 118.8 | |
| Anthracene | 104 | | 119 | |
| C1-Phen/Anthracenes | .NULL. | | .NULL. | |
| C2-Phen/Anthracenes | .NULL. | | .NULL. | |
| C3-Phen/Anthracenes | .NULL. | | .NULL. | |
| C4-Phen/Anthracenes | .NULL. | | .NULL. | |
| Dibenzothiophene | 112.7 | | 116.9 | |
| C1-Dibenzothiophenes | .NULL. | | .NULL. | |
| C2-Dibenzothiophenes | .NULL. | | .NULL. | |
| C3-Dibenzothiophenes | .NULL. | | .NULL. | |
| Fluoranthene | 98.4 | | 105.4 | |
| Pyrene | 93.7 | | 99.5 | |
| C1-Fluoranthene/Pyrenes | .NULL. | | .NULL. | |
| Benzo(a)anthracene | 108.8 | | 100.1 | |
| Chrysene | 105.5 | | 101.8 | |
| C1-Chrysenes | .NULL. | | .NULL. | |
| C2-Chrysenes | .NULL. | | .NULL. | |
| C3-Chrysenes | .NULL. | | .NULL. | |
| C4-Chrysenes | .NULL. | | .NULL. | |
| Benzo(b)fluoranthene | 106.9 | | 108.2 | |
| Benzo(k)fluoranthene | 109.8 | | 94.3 | |
| Benzo(e)pyrene | 110.9 | | 103.9 | |
| Benzo(a)pyrene | 104.7 | | 100.6 | |
| Perylene | 104.1 | | 94.1 | |
| Indeno(1,2,3-c,d)pyrene | 97.3 | | 88.8 | |
| Dibenzo(a,h)anthracene | 96.7 | | 87.9 | |
| Benzo(g,h,i)perylene | 105.5 | | 99 | |
| **TOTAL PAH** (ng/g) (Excluding Perylene) | **102.3** | | **98.2** | |

| Specific Isomers (ng/g) | Matrix Spike | Matrix Spike Dupe |
|---|---|---|
| 1-Methylnaphthalene | 94.2 | 85 |
| 2-Methylnaphthalene | 71.2 | 80.9 |
| 2,6-Dimethylnaphthalene | 78.4 | 85.3 |
| 1,6,7-Trimethylnaphthalene | 112.7 | 101.9 |
| 1-Methylphenanthrene | 102 | 105 |

| Surrogate Recoveries (%) | Matrix Spike | Matrix Spike Dupe |
|---|---|---|
| Naphthalene-d8 | 111.6 | 100.9 |
| Acenapthene-d10 | 100.5 | 96.7 |
| Phenanthrene-d10 | 104.5 | 92 |
| Chrysene-d12 | 93.6 | 90.2 |
| Perylene-d12 | 91 | 86.5 |

| | Matrix Spike | Matrix Spike Dupe |
|---|---|---|
| Total Hydrocarbon (THC in µg/g) | N/A | N/A |

# PAH Quality Control Data for Cook Inlet 1995 EMP

| QC Sample Type | Lab Sample ID | QC Sample Type | Lab Sample ID |
|---|---|---|---|
| MATRIX SPIKE | Q12414 | MATRIX SPIKE DUPE | Q12415 |

ASSOCIATED SAMPLE INFORMATION

| | Station | Survey | Rep | KLI Sample ID |
|---|---|---|---|---|
| Matrix Spike | KACHB-S | 1 | 1 | CIR95PTT0007 |
| Matrix Spike Dupe | KACHB-S | 1 | 1 | CIR95PTT0007 |

| | Matrix Spike | Matrix Spike Dupe |
|---|---|---|
| Matrix: | SEDIMENT | SEDIMENT |
| Sample Type: | SAMP | SAMP |
| Batch: | M2338 | M2338 |
| Wet weight (g) | 30.44 | 30.17 |
| Dry weight (g) | 16.07 | 15.93 |
| Solids (%) | 52.4 | 52.4 |

| ANALYTE (ng/g) | Value | Qual | Value | Qual |
|---|---|---|---|---|
| Naphthalene | 72.6 | | 70.4 | |
| C1-Naphthalenes | .NULL. | | .NULL. | |
| C2-Naphthalenes | .NULL. | | .NULL. | |
| C3-Naphthalenes | .NULL. | | .NULL. | |
| C4-Naphthalenes | .NULL. | | .NULL. | |
| Biphenyl | 83.6 | | 85 | |
| Acenaphthylene | 80.1 | | 74.5 | |
| Acenaphthene | 71.1 | | 75.3 | |
| Fluorene | 92.7 | | 92.5 | |
| C1-Fluorenes | .NULL. | | .NULL. | |
| C2-Fluorenes | .NULL. | | .NULL. | |
| C3-Fluorenes | .NULL. | | .NULL. | |
| Phenanthrene | 111.9 | | 94.4 | |
| Anthracene | 113.2 | | 104.9 | |
| C1-Phen/Anthracenes | .NULL. | | .NULL. | |
| C2-Phen/Anthracenes | .NULL. | | .NULL. | |
| C3-Phen/Anthracenes | .NULL. | | .NULL. | |
| C4-Phen/Anthracenes | .NULL. | | .NULL. | |
| Dibenzothiophene | 105.7 | | 102.2 | |
| C1-Dibenzothiophenes | .NULL. | | .NULL. | |
| C2-Dibenzothiophenes | .NULL. | | .NULL. | |
| C3-Dibenzothiophenes | .NULL. | | .NULL. | |
| Fluoranthene | 97.9 | | 78.5 | |
| Pyrene | 91.1 | | 73.5 | |
| C1-Fluoranthene/Pyrenes | .NULL. | | .NULL. | |
| Benzo(a)anthracene | 85.3 | | 88.2 | |
| Chrysene | 92 | | 82.4 | |
| C1-Chrysenes | .NULL. | | .NULL. | |
| C2-Chrysenes | .NULL. | | .NULL. | |
| C3-Chrysenes | .NULL. | | .NULL. | |
| C4-Chrysenes | .NULL. | | .NULL. | |
| Benzo(b)fluoranthene | 100.9 | | 82.2 | |
| Benzo(k)fluoranthene | 66.5 | | 70.6 | |
| Benzo(e)pyrene | 90.5 | | 92 | |
| Benzo(a)pyrene | 90 | | 86.9 | |
| Perylene | 128.7 | M | 262.2 | M |
| Indeno(1,2,3-c,d)pyrene | 79 | | 77.7 | |
| Dibenzo(a,h)anthracene | 85.4 | | 80.9 | |
| Benzo(g,h,i)perylene | 79.1 | | 83.7 | |
| **TOTAL PAH** (ng/g) (Excluding Perylene) | **92.6** | | **92.7** | |

| Specific Isomers (ng/g) | Matrix Spike | Matrix Spike Dupe |
|---|---|---|
| 1-Methylnaphthalene | 108 | 111.8 |
| 2-Methylnaphthalene | 112.5 | 105.9 |
| 2,6-Dimethylnaphthalene | 77.1 | 65.8 |
| 1,6,7-Trimethylnaphthalene | 95.9 | 94.8 |
| 1-Methylphenanthrene | 104.8 | 82.2 |

| Surrogate Recoveries (%) | Matrix Spike | Matrix Spike Dupe |
|---|---|---|
| Naphthalene-d8 | 80.5 | 85.7 |
| Acenapthene-d10 | 104.8 | 103.7 |
| Phenanthrene-d10 | 93.5 | 96.3 |
| Chrysene-d12 | 103.7 | 96.2 |
| Perylene-d12 | 105.9 | 89.3 |

| | Matrix Spike | Matrix Spike Dupe |
|---|---|---|
| Total Hydrocarbon (THC in µg/g) | N/A | N/A |

# PAH Quality Control Data for Cook Inlet 1995 EMP

| | Sample 1 | Sample 2 | Sample 3 |
|---|---|---|---|
| QC Sample Type | DUPE | DUPE | DUPE |
| Lab Sample ID | Q12325 | Q12410 | Q12416 |
| **ASSOCIATED SAMPLE INFORMATION** | | | |
| Station | EFORE-S | TRADB-S | KACHB-S |
| Survey | .NULL. | .NULL. | 1 |
| Rep | .NULL. | .NULL. | 1 |
| KLI Sample ID | RCAC941700OR | RCAC940600ORs | CIR95PTT0007 |
| Matrix: | SEDIMENT | SEDIMENT | SEDIMENT |
| Sample Type: | SAMP | SONICATE | SAMP |
| Batch: | M2328 | M2337 | M2338 |
| Wet weight (g) | 15.02 | 15.32 | 30.11 |
| Dry weight (g) | 10.18 | 8.27 | 15.77 |
| Solids (%) | 67.8 | 54 | 52.4 |

| ANALYTE (ng/g) | Q12325 Value | Qual | Q12410 Value | Qual | Q12416 Value | Qual |
|---|---|---|---|---|---|---|
| Naphthalene | 4.3 | | 6 | | 3.2 | |
| C1-Naphthalenes | 5.8 | | 8.3 | | 4 | |
| C2-Naphthalenes | 7.9 | | 0 | ND | 13.7 | |
| C3-Naphthalenes | 8.1 | | 0 | ND | 0 | ND |
| C4-Naphthalenes | 10.2 | | 0 | ND | 0 | ND |
| Biphenyl | 1 | | 2.9 | | 0.5 | |
| Acenaphthylene | 0.4 | J | 1.5 | | 0.3 | J |
| Acenaphthene | 0.4 | J | 2.3 | | 0.7 | |
| Fluorene | 1.1 | | 2.2 | | 0.7 | |
| C1-Fluorenes | 1.6 | J | 0 | ND | 2.2 | |
| C2-Fluorenes | 3 | | 0 | ND | 0 | ND |
| C3-Fluorenes | 4.8 | | 0 | ND | 0 | ND |
| Phenanthrene | 3.2 | | 6.5 | | 3.3 | |
| Anthracene | 0.4 | J | 0.5 | J | 0.2 | J |
| C1-Phen/Anthracenes | 4.9 | | 8.5 | | 0 | ND |
| C2-Phen/Anthracenes | 5.6 | | 9.4 | | 0 | ND |
| C3-Phen/Anthracenes | 7.9 | | 0 | ND | 0 | ND |
| C4-Phen/Anthracenes | 8 | | 0 | ND | 0 | ND |
| Dibenzothiophene | 0.7 | J | 1.1 | | 1.4 | |
| C1-Dibenzothiophenes | 1.1 | J | 0 | ND | 0 | ND |
| C2-Dibenzothiophenes | 2.1 | | 0 | ND | 0 | ND |
| C3-Dibenzothiophenes | 1.9 | | 0 | ND | 0 | ND |
| Fluoranthene | 0.7 | | 2.7 | | 2.8 | |
| Pyrene | 1 | | 3.3 | | 2.7 | |
| C1-Fluoranthene/Pyrenes | 2.4 | | 4.3 | | 7.1 | |
| Benzo(a)anthracene | 0.4 | J | 1.7 | | 0.5 | |
| Chrysene | 1.2 | | 2.3 | | 0.8 | |
| C1-Chrysenes | 1.3 | | 0 | ND | 0 | ND |
| C2-Chrysenes | 2.3 | | 0 | ND | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 0.9 | | 2.3 | | 0.8 | |
| Benzo(k)fluoranthene | 0.2 | J | 0.2 | J | 0.1 | J |
| Benzo(e)pyrene | 0.7 | | 1.4 | | 0.5 | |
| Benzo(a)pyrene | 0.4 | J | 0.9 | | 0.3 | J |
| Perylene | 6.1 | | 10.5 | | 50.7 | |
| Indeno(1,2,3-c,d)pyrene | 0.2 | J | 0.7 | | 0.4 | |
| Dibenzo(a,h)anthracene | 0.1 | J | 0.4 | J | 0.3 | J |
| Benzo(g,h,i)perylene | 1 | | 1.8 | | 1.2 | |
| **TOTAL PAH (ng/g) (Excluding Perylene)** | **97.2** | | **70.9** | | **47.9** | |

| Specific Isomers (ng/g) | Q12325 | Q12410 | Q12416 |
|---|---|---|---|
| 1-Methylnaphthalene | 2.3 | 3.7 | 1.6 |
| 2-Methylnaphthalene | 3.6 | 4.6 | 2.4 |
| 2,6-Dimethylnaphthalene | 3.1 | 4.1 | 1 |
| 1,6,7-Trimethylnaphthalene | 1.2 | 4.8 | 1.1 |
| 1-Methylphenanthrene | 1.3 | 2.4 | 2.9 |

| Surrogate Recoveries (%) | Q12325 | Q12410 | Q12416 |
|---|---|---|---|
| Naphthalene-d8 | 103.3 | 104 | 55.8 |
| Acenapthene-d10 | 91.5 | 101.6 | 90.5 |
| Phenanthrene-d10 | 95.5 | 109.7 | 75.6 |
| Chrysene-d12 | 89.5 | 106.8 | 85.3 |
| Perylene-d12 | 93.1 | 97.7 | 98.2 |

| | Q12325 | Q12410 | Q12416 |
|---|---|---|---|
| Total Hydrocarbon (THC in µg/g) | N/A | N/A | 53.3 |

# PAH Quality Control Data for Cook Inlet 1995 EMP

| | SRM | LAB BLANK SPIKE | LBS DUPE |
|---|---|---|---|
| Lab Sample ID | Q12413 | Q2402 | Q2403 |
| Associated Sample Information (Station, Survey, Rep, KLI Sample ID) | USE BATCH INFO | USE BATCH INFO | USE BATCH INFO |
| Matrix: | SEDIMENT | WATER | WATER |
| Sample Type: | | | |
| Batch: | M2338 | M2336 | M2336 |
| Wet weight (g) | .NULL. | N/A | N/A |
| Dry weight (g) | 1.04 | N/A | N/A |
| Solids (%) | N/A | N/A | N/A |

| ANALYTE (ng/g) | SRM Value | SRM Qual | LAB BLANK SPIKE Value | LAB BLANK SPIKE Qual | LBS DUPE Value | LBS DUPE Qual |
|---|---|---|---|---|---|---|
| Naphthalene | 713.5 | Y | 100.2 | | 95.6 | |
| C1-Naphthalenes | 398.5 | | .NULL. | | .NULL. | |
| C2-Naphthalenes | 291 | | .NULL. | | .NULL. | |
| C3-Naphthalenes | 314 | | .NULL. | | .NULL. | |
| C4-Naphthalenes | 229.8 | | .NULL. | | .NULL. | |
| Biphenyl | 98.3 | | 104 | | 104.1 | |
| Acenaphthylene | 72 | | 105.4 | | 98.7 | |
| Acenaphthene | 39.6 | | 108.1 | | 113.5 | |
| Fluorene | 91.6 | Y | 102.5 | | 99.5 | |
| C1-Fluorenes | 97.1 | | .NULL. | | .NULL. | |
| C2-Fluorenes | 252.6 | | .NULL. | | .NULL. | |
| C3-Fluorenes | 402.7 | | .NULL. | | .NULL. | |
| Phenanthrene | 445.6 | Y | 105.5 | | 100 | |
| Anthracene | 183.3 | Y | 80.5 | | 76.6 | |
| C1-Phen/Anthracenes | 362.4 | | .NULL. | | .NULL. | |
| C2-Phen/Anthracenes | 381.8 | | .NULL. | | .NULL. | |
| C3-Phen/Anthracenes | 316 | | .NULL. | | .NULL. | |
| C4-Phen/Anthracenes | 190.1 | | .NULL. | | .NULL. | |
| Dibenzothiophene | 58.8 | | 104.8 | | 102 | |
| C1-Dibenzothiophenes | 105.7 | | .NULL. | | .NULL. | |
| C2-Dibenzothiophenes | 196.3 | | .NULL. | | .NULL. | |
| C3-Dibenzothiophenes | 268.2 | | .NULL. | | .NULL. | |
| Fluoranthene | 801 | Y | 92.2 | | 89.8 | |
| Pyrene | 662.8 | Y | 87.8 | | 85.2 | |
| C1-Fluoranthene/Pyrenes | 455.5 | | .NULL. | | .NULL. | |
| Benzo(a)anthracene | 462.2 | Y | 93.6 | | 93.9 | |
| Chrysene | 623.7 | N | 104.2 | | 115.9 | |
| C1-Chrysenes | 394.6 | | .NULL. | | .NULL. | |
| C2-Chrysenes | 250 | | .NULL. | | .NULL. | |
| C3-Chrysenes | 31.1 | | .NULL. | | .NULL. | |
| C4-Chrysenes | 117.9 | | .NULL. | | .NULL. | |
| Benzo(b)fluoranthene | 1113.2 | N | 103.7 | | 95.3 | |
| Benzo(k)fluoranthene | 393.3 | Y | 85.4 | | 102.6 | |
| Benzo(e)pyrene | 575 | Y | 94.2 | | 103.2 | |
| Benzo(a)pyrene | 622.9 | Y | 85.6 | | 87.7 | |
| Perylene | 396.8 | Y | 86.1 | | 76.2 | |
| Indeno(1,2,3-c,d)pyrene | 554.9 | Y | 88.2 | | 89.6 | |
| Dibenzo(a,h)anthracene | 127.4 | N | 76.1 | | 74.6 | |
| Benzo(g,h,i)perylene | 549.8 | Y | 86.9 | | 87.8 | |
| **TOTAL PAH (ng/g)** (Excluding Perylene) | **13,244.1** | | **95.3** | | **94.8** | |

| Specific Isomers (ng/g) | SRM | LAB BLANK SPIKE | LBS DUPE |
|---|---|---|---|
| 1-Methylnaphthalene | 140.1 | 103.8 | 99.4 |
| 2-Methylnaphthalene | 258.4 | 97.3 | 91.9 |
| 2,6-Dimethylnaphthalene | 120.7 | 100.3 | 100.3 |
| 1,6,7-Trimethylnaphthalene | 70.4 | 86.9 | 88.4 |
| 1-Methylphenanthrene | 82.2 | 98.2 | 97.8 |

| Surrogate Recoveries (%) | SRM | LAB BLANK SPIKE | LBS DUPE |
|---|---|---|---|
| Naphthalene-d8 | 81.7 | 87.3 | 94.7 |
| Acenapthene-d10 | 85.3 | 97 | 102.6 |
| Phenanthrene-d10 | 91.6 | 89.7 | 96.3 |
| Chrysene-d12 | 79.9 | 94.3 | 92.1 |
| Perylene-d12 | 87.2 | 80.8 | 84.9 |

| | SRM | LAB BLANK SPIKE | LBS DUPE |
|---|---|---|---|
| Total Hydrocarbon (THC in µg/g) | N/A | N/A | N/A |

# PAH Quality Control Data for Cook Inlet 1995 EMP

| | Sample 1 | | Sample 2 | | Sample 3 | |
|---|---|---|---|---|---|---|
| QC Sample Type | PROC BLANK | | PROC BLANK | | PROC BLANK | |
| Lab Sample ID | Q12322 | | Q12407 | | Q12412 | |
| **ASSOCIATED SAMPLE INFORMATION** (Station, Survey, Rep, KLI Sample ID) | USE BATCH INFO | | USE BATCH INFO | | USE BATCH INFO | |
| Matrix: | SEDIMENT | | SEDIMENT | | SEDIMENT | |
| Sample Type: | | | | | | |
| Batch: | M2328 | | M2337 | | M2338 | |
| Wet weight (g) | .NULL. | | .NULL. | | .NULL. | |
| Dry weight (g) | 10 | | 10 | | 10 | |
| Solids (%) | N/A | | N/A | | N/A | |
| **ANALYTE (ng/g)** | **Value** | **Qual** | **Value** | **Qual** | **Value** | **Qual** |
| Naphthalene | 2.3 | | 1.7 | | 1.6 | J |
| C1-Naphthalenes | 1.3 | J | 1.5 | J | 2.2 | J |
| C2-Naphthalenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Naphthalenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Naphthalenes | 0 | ND | 0 | ND | 0 | ND |
| Biphenyl | 0.6 | | 0.9 | | 1.3 | |
| Acenaphthylene | 0.2 | J | 0.5 | J | 0.8 | |
| Acenaphthene | 0.2 | J | 1.6 | | 0.8 | J |
| Fluorene | 0.3 | J | 0.7 | J | 0.3 | J |
| C1-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Fluorenes | 0 | ND | 0 | ND | 0 | ND |
| Phenanthrene | 0.6 | J | 0.8 | J | 0.6 | J |
| Anthracene | 0.2 | J | 0.3 | J | 0.4 | J |
| C1-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| Dibenzothiophene | 0.4 | J | 0.7 | J | 0.5 | J |
| C1-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND | 0 | ND | 0 | ND |
| Fluoranthene | 0.3 | J | 0.1 | J | 0.4 | J |
| Pyrene | 0.3 | J | 0.7 | | 0.4 | J |
| C1-Fluoranthene/Pyrenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(a)anthracene | 0 | J | 1 | | 0.1 | J |
| Chrysene | 0.1 | J | 0.4 | J | 0.2 | J |
| C1-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 0.1 | J | 0.1 | J | 0.2 | J |
| Benzo(k)fluoranthene | 0 | J | 0.1 | J | 0.1 | J |
| Benzo(e)pyrene | 0.1 | J | 0.4 | | 0.1 | J |
| Benzo(a)pyrene | 0.2 | J | 0.3 | J | 0.1 | J |
| Perylene | 0.2 | J | 0.1 | J | 0.4 | J |
| Indeno(1,2,3-c,d)pyrene | 0.1 | J | 0 | J | 0.2 | J |
| Dibenzo(a,h)anthracene | 0.1 | J | 0.1 | J | 0.2 | J |
| Benzo(g,h,i)perylene | 0.1 | J | 0.2 | J | 0.3 | J |
| **TOTAL PAH (ng/g)** (Excluding Perylene) | 7.4 | | 12.1 | | 10.7 | |
| **Specific Isomers (ng/g)** | | | | | | |
| 1-Methylnaphthalene | 0.3 | J | 0.8 | J | 1.4 | J |
| 2-Methylnaphthalene | 0.9 | J | 0.7 | J | 0.9 | J |
| 2,6-Dimethylnaphthalene | 0.5 | J | 1.9 | | 0.7 | J |
| 1,6,7-Trimethylnaphthalene | 0.3 | J | 1.6 | | 0.4 | J |
| 1-Methylphenanthrene | 0.1 | J | 0.7 | J | 0.3 | J |
| **Surrogate Recoveries (%)** | | | | | | |
| Naphthalene-d8 | 103.8 | | 87 | | 116.6 | |
| Acenapthene-d10 | 90.7 | | 106.4 | | 103.4 | |
| Phenanthrene-d10 | 95.2 | | 80 | | 109.2 | |
| Chrysene-d12 | 89.1 | | 72.6 | | 104.5 | |
| Perylene-d12 | 74.3 | | 90.3 | | 46.1 | |
| Total Hydrocarbon (THC in µg/g) | N/A | | N/A | | 1.0 | < |

# PAH Quality Control Data for Cook Inlet 1995 EMP

| QC Sample Type | Lab Sample ID |
|---|---|
| PROC BLANK | Q2401 |

ASSOCIATED SAMPLE INFORMATION

| Station | Survey | Rep | KLI Sample ID |
|---|---|---|---|
| | | | USE BATCH INFO |

Matrix: WATER

Sample Type:

Batch: M2336

Wet weight (g) N/A

Dry weight (g) N/A

Solids (%) N/A

| ANALYTE (ng/g) | Value | Qual |
|---|---|---|
| Naphthalene | 1.5 | J |
| C1-Naphthalenes | 0.8 | J |
| C2-Naphthalenes | 0 | ND |
| C3-Naphthalenes | 0 | ND |
| C4-Naphthalenes | 0 | ND |
| Biphenyl | 0.4 | J |
| Acenaphthylene | 0.3 | J |
| Acenaphthene | 0.6 | J |
| Fluorene | 0.4 | J |
| C1-Fluorenes | 0 | ND |
| C2-Fluorenes | 0 | ND |
| C3-Fluorenes | 0 | ND |
| Phenanthrene | 1.2 | J |
| Anthracene | 0.5 | J |
| C1-Phen/Anthracenes | 0 | ND |
| C2-Phen/Anthracenes | 0 | ND |
| C3-Phen/Anthracenes | 0 | ND |
| C4-Phen/Anthracenes | 0 | ND |
| Dibenzothiophene | 0.4 | J |
| C1-Dibenzothiophenes | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND |
| Fluoranthene | 0.6 | J |
| Pyrene | 0.5 | J |
| C1-Fluoranthene/Pyrenes | 0 | ND |
| Benzo(a)anthracene | 0.1 | J |
| Chrysene | 0.1 | J |
| C1-Chrysenes | 0 | ND |
| C2-Chrysenes | 0 | ND |
| C3-Chrysenes | 0 | ND |
| C4-Chrysenes | 0 | ND |
| Benzo(b)fluoranthene | 0.1 | J |
| Benzo(k)fluoranthene | 0 | ND |
| Benzo(e)pyrene | 0.1 | J |
| Benzo(a)pyrene | 0.1 | J |
| Perylene | 0.1 | J |
| Indeno(1,2,3-c,d)pyrene | 0 | ND |
| Dibenzo(a,h)anthracene | 0.1 | J |
| Benzo(g,h,i)perylene | 0.2 | J |
| **TOTAL PAH** (ng/g) (Excluding Perylene) | **8.0** | |

| Specific Isomers (ng/g) | | |
|---|---|---|
| 1-Methylnaphthalene | 0.3 | J |
| 2-Methylnaphthalene | 0.5 | J |
| 2,6-Dimethylnaphthalene | 0.4 | J |
| 1,6,7-Trimethylnaphthalene | 0.1 | J |
| 1-Methylphenanthrene | 0.2 | J |

| Surrogate Recoveries (%) | |
|---|---|
| Naphthalene-d8 | 81.1 |
| Acenapthene-d10 | 87 |
| Phenanthrene-d10 | 87.2 |
| Chrysene-d12 | 84.5 |
| Perylene-d12 | 89.4 |

Total Hydrocarbon (THC in µg/g) **N/A**

# PAH Quality Control Data for Cook Inlet 1995 EMP

| | Sample 1 | Sample 2 | Sample 3 |
|---|---|---|---|
| QC Sample Type | REFERENCE OIL | REFERENCE OIL | REFERENCE OIL |
| Lab Sample ID | W3840 | W3890 | W3917 |

**ASSOCIATED SAMPLE INFORMATION**

| Station | Survey | Rep | KLI Sample ID |
|---|---|---|---|
| | | | USE BATCH INFO |

| | W3840 | W3890 | W3917 |
|---|---|---|---|
| Matrix: | OIL | OIL | OIL |
| Sample Type: | | | |
| Batch: | M2336 | M2337 | M2338 |
| Wet weight (g) | N/A | N/A | N/A |
| Dry weight (g) | N/A | N/A | N/A |
| Solids (%) | N/A | N/A | N/A |

| ANALYTE | W3840 Value | Qual | W3890 Value | Qual | W3917 Value | Qual |
|---|---|---|---|---|---|---|
| Naphthalene | 439.3 | Y | 394 | Y | 445.6 | Y |
| C1-Naphthalenes | 1910.9 | Y | 1846.4 | Y | 2044.5 | Y |
| C2-Naphthalenes | 1756.8 | Y | 1620.8 | Y | 1714.4 | Y |
| C3-Naphthalenes | 1646.7 | Y | 1343.4 | Y | 1560.4 | Y |
| C4-Naphthalenes | 803.7 | Y | 788.4 | Y | 673.8 | Y |
| Biphenyl | 204.8 | Y | 193.9 | Y | 184.7 | Y |
| Acenaphthylene | 1.8 | J | 3.9 | J | 4.9 | J |
| Acenaphthene | 11 | J | 17.5 | J | 20 | Y |
| Fluorene | 90.5 | Y | 93.5 | Y | 93.5 | Y |
| C1-Fluorenes | 323.5 | N | 269.8 | Y | 216.5 | Y |
| C2-Fluorenes | 404.2 | Y | 437.1 | Y | 397.5 | Y |
| C3-Fluorenes | 536.2 | Y | 463.6 | Y | 307.4 | Y |
| Phenanthrene | 266.7 | Y | 281.9 | Y | 300.8 | Y |
| Anthracene | 4.8 | J | 5.4 | J | 2.3 | J |
| C1-Phen/Anthracenes | 600.2 | Y | 630.3 | Y | 686 | Y |
| C2-Phen/Anthracenes | 770.2 | Y | 666.5 | Y | 754.8 | Y |
| C3-Phen/Anthracenes | 708.6 | Y | 597 | Y | 532.8 | Y |
| C4-Phen/Anthracenes | 310.2 | Y | 213.1 | Y | 210.9 | Y |
| Dibenzothiophene | 226.4 | Y | 236.9 | Y | 267.4 | Y |
| C1-Dibenzothiophenes | 431.6 | Y | 454.5 | Y | 468.9 | Y |
| C2-Dibenzothiophenes | 665.6 | Y | 615.3 | Y | 599.2 | Y |
| C3-Dibenzothiophenes | 625.2 | Y | 622.6 | Y | 498.7 | Y |
| Fluoranthene | 2.5 | J | 4 | J | 5.6 | J |
| Pyrene | 13.8 | J | 10.9 | J | 12.1 | J |
| C1-Fluoranthene/Pyrenes | 91.2 | Y | 67.1 | Y | 81.8 | Y |
| Benzo(a)anthracene | 2.9 | J | 10.2 | J | 4.2 | J |
| Chrysene | 47 | Y | 41.6 | Y | 44.7 | Y |
| C1-Chrysenes | 96.4 | Y | 92.1 | Y | 5.3 | J |
| C2-Chrysenes | 137.1 | Y | 114.7 | Y | 7.1 | J |
| C3-Chrysenes | 22.2 | Y | 20.8 | Y | 1.1 | J |
| C4-Chrysenes | 24.4 | Y | 20.9 | Y | 0.9 | J |
| Benzo(b)fluoranthene | 5.2 | J | 6.1 | J | 6.5 | J |
| Benzo(k)fluoranthene | 0.9 | J | 0.5 | J | 0.6 | J |
| Benzo(e)pyrene | 11.9 | J | 10 | J | 13.1 | J |
| Benzo(a)pyrene | 7 | J | 2.1 | J | 2.5 | J |
| Perylene | 1.7 | J | 0.5 | J | 0.6 | J |
| Indeno(1,2,3-c,d)pyrene | 1.2 | J | 0.9 | J | 1.6 | J |
| Dibenzo(a,h)anthracene | 1.5 | J | 1.9 | J | 2.2 | J |
| Benzo(g,h,i)perylene | 3.4 | J | 4.7 | J | 4.3 | J |
| **TOTAL PAH (ng/g)** (Excluding Perylene) | **13,156.0** | | **12,204.1** | | **12,178.1** | |
| **Specific Isomers (ng/g)** | | | | | | |
| 1-Methylnaphthalene | 854.2 | Y | 808.7 | | 889.7 | Y |
| 2-Methylnaphthalene | 1056.7 | Y | 1037.8 | | 1154.8 | Y |
| 2,6-Dimethylnaphthalene | 809.9 | Y | 700.8 | | 655.2 | Y |
| 1,6,7-Trimethylnaphthalene | 428 | Y | 377.9 | | 376.5 | Y |
| 1-Methylphenanthrene | 151.4 | Y | 163.8 | | 190.2 | Y |
| **Surrogate Recoveries (%)** | | | | | | |
| Naphthalene-d8 | .NULL. | | .NULL. | | .NULL. | |
| Acenapthene-d10 | .NULL. | | .NULL. | | .NULL. | |
| Phenanthrene-d10 | .NULL. | | .NULL. | | .NULL. | |
| Chrysene-d12 | .NULL. | | .NULL. | | .NULL. | |
| Perylene-d12 | .NULL. | | .NULL. | | .NULL. | |
| Total Hydrocarbon (THC in µg/g) | N/A | | N/A | | N/A | |

# APPENDIX B

## Sediment Results

## 4.0 PGS and TOC Data

# Particle Grain Size and Total Organic Carbon Data for Cook Inlet 1995 EMP

| Station | Survey | Replicate | Sand (%) | Silt (%) | Clay (%) | Silt + Clay (%) | PGS Sample ID | PGS Labsamp ID | TOC Sample ID | TOC Labsamp ID | Total Organic Carbon (%) | Total Inorganic Carbon (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EFORE-S | 1 | 1 | 63.4 | 20.4 | 16.3 | 36.7 | CIR95PGS0010 | C21136 | CIR95PTT0010 | C21151 | 0.41 | 0.09 |
| EFORE-S | 1 | 2 | 39.4 | 33.1 | 27.6 | 60.7 | CIR95PGS0011 | C21137 | CIR95PTT0011 | C21152 | 0.22 | < 0.02 |
| EFORE-S | 1 | 3 | 92.3 | 5.4 | 2.4 | 7.8 | CIR95PGS0012 | C21138 | CIR95PTT0012 | C21153 | 0.13 | 0.02 |
| KACHB-S | 1 | 1 | 33.5 | 35.0 | 31.4 | 66.4 | CIR95PGS0007 | C21133 | CIR95PTT0007 | C21148 | 1.59 | 0.19 |
| KACHB-S | 1 | 2 | 29.3 | 35.2 | 35.5 | 70.7 | CIR95PGS0008 | C21134 | CIR95PTT0008 | C21149 | 1.50 | 0.09 |
| KACHB-S | 1 | 3 | 37.0 | 33.7 | 29.3 | 63.0 | CIR95PGS0009 | C21135 | CIR95PTT0009 | C21150 | 1.36 | 0.17 |

## Particle Grain Size and Total Organic Carbon Data for Cook Inlet 1995 EMP

| Station | Survey | Replicate | Sand (%) | Silt (%) | Clay (%) | Silt + Clay (%) | PGS Sample ID | PGS Labsamp ID | TOC Sample ID | TOC Labsamp ID | Total Organic Carbon (%) | Total Inorganic Carbon (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KAMIB-S | 1 | 1 | 74.1 | 16.1 | 9.9 | 26.0 | CIR95PGS0004 | C21130 | CIR95PTT0004 | C21145 | 1.48 | 2.96 |
| KAMIB-S | 1 | 2 | 74.1 | 16.8 | 9.0 | 25.8 | CIR95PGS0005 | C21131 | CIR95PTT0005 | C21146 | 0.39 | 3.20 |
| KAMIB-S | 1 | 3 | 62.7 | 23.3 | 14.1 | 37.4 | CIR95PGS0006 | C21132 | CIR95PTT0006 | C21147 | 0.35 | 2.08 |
| NULLZ-S | 1 | 1 | 87.8 | 4.1 | 8.1 | 12.2 | CIR95PGS0001 | C21127 | CIR95PTT0001 | C21142 | 0.43 | 0.60 |
| NULLZ-S | 1 | 2 | 86.2 | 4.7 | 9.1 | 13.8 | CIR95PGS0002 | C21128 | CIR95PTT0002 | C21143 | 0.43 | 0.77 |
| NULLZ-S | 1 | 3 | 84.2 | 6.4 | 9.4 | 15.8 | CIR95PGS0003 | C21129 | CIR95PTT0003 | C21144 | 0.48 | 0.66 |

# Particle Grain Size and Total Organic Carbon Data for Cook Inlet 1995 EMP

| Station | Survey | Replicate |
|---|---|---|
| TRADB-S | 1 | 1 |

| | |
|---|---|
| Sand (%) | 16.1 |
| Silt (%) | 52.1 |
| Clay (%) | 31.8 |
| Silt + Clay (%) | 83.9 |

| PGS Sample ID | PGS Labsamp ID |
|---|---|
| CIR95PGS0013 | C21139 |

| TOC Sample ID | TOC Labsamp ID |
|---|---|
| CIR95PTT0013 | C21154 |

| | |
|---|---|
| Total Organic Carbon (%) | 0.50 |
| Total Inorganic Carbon (%) | 0.13 |

| Station | Survey | Replicate |
|---|---|---|
| TRADB-S | 1 | 2 |

| | |
|---|---|
| Sand (%) | 21.1 |
| Silt (%) | 52.1 |
| Clay (%) | 26.8 |
| Silt + Clay (%) | 78.9 |

| PGS Sample ID | PGS Labsamp ID |
|---|---|
| CIR95PGS0014 | C21140 |

| TOC Sample ID | TOC Labsamp ID |
|---|---|
| CIR95PTT0014 | C21155 |

| | |
|---|---|
| Total Organic Carbon (%) | 0.50 |
| Total Inorganic Carbon (%) | 0.12 |

| Station | Survey | Replicate |
|---|---|---|
| TRADB-S | 1 | 3 |

| | |
|---|---|
| Sand (%) | 9.4 |
| Silt (%) | 63.8 |
| Clay (%) | 26.8 |
| Silt + Clay (%) | 90.6 |

| PGS Sample ID | PGS Labsamp ID |
|---|---|
| CIR95PGS0015 | C21141 |

| TOC Sample ID | TOC Labsamp ID |
|---|---|
| CIR95PTT0015 | C21156 |

| | |
|---|---|
| Total Organic Carbon (%) | 0.53 |
| Total Inorganic Carbon (%) | 0.13 |

# APPENDIX B

## Sediment Results

## 5.0 Microtox® Data

# Microtox Data for Cook Inlet 1995 EMP

| STATION ID: | SURVEY : | REP : | Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) |
|---|---|---|---|---|---|---|
| EFORE-S | 1 | 1 | CIR95MCT0010 | CIR95MCT0010-A | > 1.63 | > 1.63 |
| EFORE-S | 1 | 1 | CIR95MCT0010 | CIR95MCT0010-B | > 1.63 | > 1.63 |
| EFORE-S | 1 | 2 | CIR95MCT0011 | CIR95MCT0011-A | > 1.63 | > 1.63 |
| EFORE-S | 1 | 2 | CIR95MCT0011 | CIR95MCT0011-B | > 1.63 | > 1.63 |
| EFORE-S | 1 | 3 | CIR95MCT0012 | CIR95MCT0012-A | > 1.63 | > 1.63 |
| EFORE-S | 1 | 3 | CIR95MCT0012 | CIR95MCT0012-B | > 1.63 | > 1.63 |
| KACHB-S | 1 | 1 | CIR95MCT0007 | CIR95MCT0007-A | > 1.63 | > 1.63 |
| KACHB-S | 1 | 1 | CIR95MCT0007 | CIR95MCT0007-B | > 1.63 | > 1.63 |
| KACHB-S | 1 | 2 | CIR95MCT0008 | CIR95MCT0008-A | > 1.63 | > 1.63 |
| KACHB-S | 1 | 2 | CIR95MCT0008 | CIR95MCT0008-B | > 1.63 | > 1.63 |
| KACHB-S | 1 | 3 | CIR95MCT0009 | CIR95MCT0009-A | > 1.63 | > 1.63 |
| KACHB-S | 1 | 3 | CIR95MCT0009 | CIR95MCT0009-B | > 1.63 | > 1.63 |

# Microtox Data for Cook Inlet 1995 EMP

| STATION ID: | KAMIB-S | SURVEY : | 1 | REP : | 1 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0004 | CIR95MCT0004-A | > 1.63 | > 1.63 | | |

| STATION ID: | KAMIB-S | SURVEY : | 1 | REP : | 1 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0004 | CIR95MCT0004-B | > 1.63 | > 1.63 | | |

| STATION ID: | KAMIB-S | SURVEY : | 1 | REP : | 2 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0005 | CIR95MCT0005-A | > 1.63 | > 1.63 | | |

| STATION ID: | KAMIB-S | SURVEY : | 1 | REP : | 2 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0005 | CIR95MCT0005-B | > 1.63 | > 1.63 | | |

| STATION ID: | KAMIB-S | SURVEY : | 1 | REP : | 3 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0006 | CIR95MCT0006-A | > 1.63 | > 1.63 | | |

| STATION ID: | KAMIB-S | SURVEY : | 1 | REP : | 3 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0006 | CIR95MCT0006-B | > 1.63 | > 1.63 | | |

| STATION ID: | NULLZ-S | SURVEY : | 1 | REP : | 1 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0001 | CIR95MCT0001-A | > 1.63 | > 1.63 | | |

| STATION ID: | NULLZ-S | SURVEY : | 1 | REP : | 1 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0001 | CIR95MCT0001-B | > 1.63 | > 1.63 | | |

| STATION ID: | NULLZ-S | SURVEY : | 1 | REP : | 2 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0002 | CIR95MCT0002-A | > 1.63 | > 1.63 | | |

| STATION ID: | NULLZ-S | SURVEY : | 1 | REP : | 2 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0002 | CIR95MCT0002-B | > 1.63 | > 1.63 | | |

| STATION ID: | NULLZ-S | SURVEY : | 1 | REP : | 3 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0003 | CIR95MCT0003-A | > 1.63 | > 1.63 | | |

| STATION ID: | NULLZ-S | SURVEY : | 1 | REP : | 3 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | EC50 15 Minute (mg/mL) | | |
| CIR95MCT0003 | CIR95MCT0003-B | > 1.63 | > 1.63 | | |

# Microtox Data for Cook Inlet 1995 EMP

| STATION ID: | TRADB-S | SURVEY : | 1 | REP : | 1 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | | EC50 15 Minute (mg/mL) | |
| CIR95MCT0013 | CIR95MCT0013-A | > 1.63 | | > 1.63 | |

| STATION ID: | TRADB-S | SURVEY : | 1 | REP : | 1 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | | EC50 15 Minute (mg/mL) | |
| CIR95MCT0013 | CIR95MCT0013-B | > 1.63 | | > 1.63 | |

| STATION ID: | TRADB-S | SURVEY : | 1 | REP : | 2 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | | EC50 15 Minute (mg/mL) | |
| CIR95MCT0014 | CIR95MCT0014-A | > 1.63 | | > 1.63 | |

| STATION ID: | TRADB-S | SURVEY : | 1 | REP : | 2 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | | EC50 15 Minute (mg/mL) | |
| CIR95MCT0014 | CIR95MCT0014-B | > 1.63 | | > 1.63 | |

| STATION ID: | TRADB-S | SURVEY : | 1 | REP : | 3 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | | EC50 15 Minute (mg/mL) | |
| CIR95MCT0015 | CIR95MCT0015-A | > 1.63 | | > 1.63 | |

| STATION ID: | TRADB-S | SURVEY : | 1 | REP : | 3 |
|---|---|---|---|---|---|
| Sample ID | Labsamp ID | EC50 5 Minute (mg/mL) | | EC50 15 Minute (mg/mL) | |
| CIR95MCT0015 | CIR95MCT0015-B | > 1.63 | | > 1.63 | |

# APPENDIX C

## SPMD Results

## 1.0 PAH Data

# PAH Data for Cook Inlet 1995 EMP

| | Sample 1 | Sample 2 | Sample 3 |
|---|---|---|---|
| Station | EFORE-M | EFORE-M | EFORE-M |
| Survey | 1 | 2 | 2 |
| Replicate | FB | SFC | BOT |
| KLI Sample ID | CIR95SPM0003 | CIR95SPM0004 | CIR95SPM0005 |
| Lab Sample ID | C21918 | C21919 | C21920 |
| Matrix: | SPMD | SPMD | SPMD |
| Sample Type: | FIELD BLANK | SAMP | SAMP |
| Batch: | M1609 | M1609 | M1609 |
| Wet weight (g) | N/A | N/A | N/A |
| Dry weight (g) | N/A | N/A | N/A |
| Solids (%) | N/A | N/A | N/A |

| ANALYTE (ng/SPMD) | EFORE-M 1 FB Value | Qual | EFORE-M 2 SFC Value | Qual | EFORE-M 2 BOT Value | Qual |
|---|---|---|---|---|---|---|
| Naphthalene | 292.1 | | 72.4 | | 101.5 | |
| C1-Naphthalenes | 216.3 | | 92.8 | | 202.2 | |
| C2-Naphthalenes | 256.3 | | 193.3 | | 175.4 | |
| C3-Naphthalenes | 264.6 | | 373.4 | | 264.7 | |
| C4-Naphthalenes | 246.4 | | 378.5 | | 372.3 | |
| Biphenyl | 72.1 | | 17.7 | | 26.5 | |
| Acenaphthylene | 16.7 | | 0 | ND | 25.6 | |
| Acenaphthene | 32.9 | | 17.9 | | 0 | ND |
| Fluorene | 30.0 | | 18.7 | | 29.3 | |
| C1-Fluorenes | 120.7 | | 130.8 | | 599.2 | |
| C2-Fluorenes | 126.1 | | 174.2 | | 953.4 | |
| C3-Fluorenes | 129.3 | | 194.1 | | 1269.6 | |
| Phenanthrene | 68.6 | | 225.5 | | 236.5 | |
| Anthracene | 7.9 | | 21.4 | | 21.0 | |
| C1-Phen/Anthracenes | 80.9 | | 320.2 | | 331.2 | |
| C2-Phen/Anthracenes | 67.5 | | 538.2 | | 422.4 | |
| C3-Phen/Anthracenes | 148.4 | | 507.7 | | 345.2 | |
| C4-Phen/Anthracenes | 30.1 | | 197.1 | | 203.9 | |
| Dibenzothiophene | 9.7 | | 35.2 | | 30.6 | |
| C1-Dibenzothiophenes | 35.7 | | 170.4 | | 123.7 | |
| C2-Dibenzothiophenes | 42.2 | | 182.3 | | 210.4 | |
| C3-Dibenzothiophenes | 55.2 | | 271.5 | | 211.9 | |
| Fluoranthene | 15.9 | | 96.1 | | 80.7 | |
| Pyrene | 15.6 | | 100.7 | | 96.2 | |
| C1-Fluoranthene/Pyrenes | 0 | ND | 154.4 | | 21.5 | |
| Benzo(a)anthracene | 3.9 | J | 7.7 | | 11.5 | |
| Chrysene | 2.7 | J | 12.6 | | 7.0 | J |
| C1-Chrysenes | 0 | ND | 28.3 | | 18.0 | J |
| C2-Chrysenes | 0 | ND | 28.5 | | 36.1 | |
| C3-Chrysenes | 0 | ND | 0 | ND | 13.9 | J |
| C4-Chrysenes | 0 | ND | 0 | ND | 26.2 | |
| Benzo(b)fluoranthene | 2.8 | J | 7.7 | | 4.3 | |
| Benzo(k)fluoranthene | 0.5 | J | 7.7 | | 1.3 | J |
| Benzo(e)pyrene | 5.0 | | 5.2 | | 5.1 | |
| Benzo(a)pyrene | 3.3 | J | 6.9 | | 4.6 | J |
| Perylene | 0 | ND | 15.2 | | 12.5 | |
| Indeno(1,2,3-c,d)pyrene | 0 | ND | 3.9 | J | 3.3 | J |
| Dibenzo(a,h)anthracene | 0 | ND | 2.6 | J | 2.9 | |
| Benzo(g,h,i)perylene | 4.4 | | 10.0 | | 5.6 | |
| **TOTAL PAH (ng/SPMD) (Excluding Perylene)** | **2,403.8** | | **4,605.6** | | **6,494.7** | |
| **Specific Isomers (ng/SPMD)** | | | | | | |
| 1-Methylnaphthalene | 84.1 | | 50.3 | | 113.6 | |
| 2-Methylnaphthalene | 132.2 | | 42.5 | | 88.6 | |
| 2,6-Dimethylnaphthalene | 77.1 | | 36.0 | | 58.3 | |
| 1,6,7-Trimethylnaphthalene | 36.2 | | 61.0 | | 44.9 | |
| 1-Methylphenanthrene | 18.8 | | 76.0 | | 51.1 | |
| **Surrogate Recoveries (%)** | | | | | | |
| Naphthalene-d8 | 55.0 | | 65.6 | | 63.0 | |
| Acenapthene-d10 | 55.6 | | 76.1 | | 70.4 | |
| Phenanthrene-d10 | 91.3 | | 34.2 | M | 168.9 | M |
| Chrysene-d12 | 53.5 | | 72.1 | | 62.3 | |
| Perylene-d12 | 49.9 | | 37.8 | M | 45.5 | |
| **Total Hydrocarbon (THC in mg/SPMD)** | **0.37** | | **0.65** | | **0.47** | |

# PAH Data for Cook Inlet 1995 EMP

| | Sample 1 | | Sample 2 | | Sample 3 | |
|---|---|---|---|---|---|---|
| Station | KACHB-M | | KACHB-M | | KACHB-M | |
| Survey | 1 | | 2 | | 2 | |
| Replicate | FB | | SFC | | BOT | |
| KLI Sample ID | CIR95SPM0001 | | CIR95SPM0008 | | CIR95SPM0009 | |
| Lab Sample ID | C21916 | | C21923 | | C21924 | |
| Matrix: | SPMD | | SPMD | | SPMD | |
| Sample Type: | FIELD BLANK | | SAMP | | SAMP | |
| Batch: | M1609 | | M1609 | | M1609 | |
| Wet weight (g) | N/A | | N/A | | N/A | |
| Dry weight (g) | N/A | | N/A | | N/A | |
| Solids (%) | N/A | | N/A | | N/A | |
| **ANALYTE (ng/SPMD)** | **Value** | **Qual** | **Value** | **Qual** | **Value** | **Qual** |
| Naphthalene | 311.2 | | 88.7 | | 74.0 | |
| C1-Naphthalenes | 199.9 | | 147.2 | | 133.3 | |
| C2-Naphthalenes | 182.6 | | 321.1 | | 221.5 | |
| C3-Naphthalenes | 219.0 | | 764.9 | | 405.0 | |
| C4-Naphthalenes | 179.0 | | 684.4 | | 356.3 | |
| Biphenyl | 71.6 | | 22.0 | | 21.8 | |
| Acenaphthylene | 0 | ND | 19.3 | | 11.1 | |
| Acenaphthene | 45.2 | | 43.2 | | 32.9 | |
| Fluorene | 22.6 | | 58.0 | | 47.8 | |
| C1-Fluorenes | 128.8 | | 235.4 | | 936.2 | |
| C2-Fluorenes | 154.1 | | 382.0 | | 1449.1 | |
| C3-Fluorenes | 139.4 | | 298.7 | | 1016.4 | |
| Phenanthrene | 89.0 | | 320.6 | | 430.3 | |
| Anthracene | 9.3 | | 6.0 | | 19.0 | |
| C1-Phen/Anthracenes | 78.4 | | 444.1 | | 461.2 | |
| C2-Phen/Anthracenes | 91.0 | | 377.3 | | 332.9 | |
| C3-Phen/Anthracenes | 265.3 | | 229.8 | | 313.8 | |
| C4-Phen/Anthracenes | 57.7 | | 76.2 | | 129.6 | |
| Dibenzothiophene | 15.8 | | 36.9 | | 42.2 | |
| C1-Dibenzothiophenes | 54.2 | | 146.0 | | 185.4 | |
| C2-Dibenzothiophenes | 55.7 | | 170.4 | | 193.2 | |
| C3-Dibenzothiophenes | 91.4 | | 131.1 | | 224.7 | |
| Fluoranthene | 17.9 | | 298.0 | | 288.9 | |
| Pyrene | 17.3 | | 85.3 | | 152.2 | |
| C1-Fluoranthene/Pyrenes | 0 | ND | 80.0 | | 18.2 | |
| Benzo(a)anthracene | 4.0 | J | 12.3 | | 29.1 | |
| Chrysene | 4.8 | J | 26.0 | | 12.7 | |
| C1-Chrysenes | 0 | ND | 0 | ND | 12.2 | J |
| C2-Chrysenes | 0 | ND | 0 | ND | 22.5 | |
| C3-Chrysenes | 0 | ND | 0 | ND | 4.9 | J |
| C4-Chrysenes | 0 | ND | 0 | ND | 15.1 | J |
| Benzo(b)fluoranthene | 0 | ND | 10.5 | | 8.7 | |
| Benzo(k)fluoranthene | 0 | ND | 4.3 | | 4.7 | |
| Benzo(e)pyrene | 1.9 | J | 7.5 | | 7.9 | |
| Benzo(a)pyrene | 2.8 | J | 4.6 | J | 5.8 | |
| Perylene | 2.5 | J | 20.7 | | 21.3 | |
| Indeno(1,2,3-c,d)pyrene | 0 | ND | 4.4 | J | 4.4 | J |
| Dibenzo(a,h)anthracene | 0 | ND | 3.1 | | 1.3 | J |
| Benzo(g,h,i)perylene | 4.0 | | 6.1 | | 9.6 | |
| **TOTAL PAH (ng/SPMD)** (Excluding Perylene) | **2,513.9** | | **5,545.4** | | **7,635.9** | |
| **Specific Isomers (ng/SPMD)** | | | | | | |
| 1-Methylnaphthalene | 79.4 | | 46.5 | | 74.5 | |
| 2-Methylnaphthalene | 120.5 | | 100.7 | | 58.8 | |
| 2,6-Dimethylnaphthalene | 66.8 | | 78.1 | | 54.8 | |
| 1,6,7-Trimethylnaphthalene | 39.0 | | 105.9 | | 82.2 | |
| 1-Methylphenanthrene | 17.7 | | 115.6 | | 105.8 | |
| **Surrogate Recoveries (%)** | | | | | | |
| Naphthalene-d8 | 59.3 | | 59.9 | | 60.2 | |
| Acenapthene-d10 | 54.3 | | 87.2 | | 68.5 | |
| Phenanthrene-d10 | 65.3 | | 75.1 | | 195.1 | M |
| Chrysene-d12 | 62.7 | | 65.3 | | 67.5 | |
| Perylene-d12 | 46.0 | | 33.8 | M | 46.5 | |
| **Total Hydrocarbon (THC in mg/SPMD)** | **0.20** | | **0.54** | | **0.37** | |

# PAH Data for Cook Inlet 1995 EMP

| | Sample 1 | Sample 2 | Sample 3 |
|---|---|---|---|
| Station | TRADB-M | TRADB-M | TRADB-M |
| Survey | 1 | 2 | 2 |
| Replicate | FB | SFC | BOT |
| KLI Sample ID | CIR95SPM0002 | CIR95SPM0006 | CIR95SPM0007 |
| Lab Sample ID | C21917 | C21921 | C21922 |
| Matrix: | SPMD | SPMD | SPMD |
| Sample Type: | FIELD BLANK | SAMP | SAMP |
| Batch: | M1609 | M1609 | M1609 |
| Wet weight (g) | N/A | N/A | N/A |
| Dry weight (g) | N/A | N/A | N/A |
| Solids (%) | N/A | N/A | N/A |

| ANALYTE (ng/SPMD) | Value | Qual | Value | Qual | Value | Qual |
|---|---|---|---|---|---|---|
| Naphthalene | 306.1 | | 170.7 | | 235.7 | |
| C1-Naphthalenes | 228.8 | | 770.1 | | 949.2 | |
| C2-Naphthalenes | 243.7 | | 976.8 | | 1249.9 | |
| C3-Naphthalenes | 246.1 | | 1322.7 | | 2006.5 | |
| C4-Naphthalenes | 220.3 | | 1081.8 | | 1504.8 | |
| Biphenyl | 58.3 | | 44.8 | | 63.0 | |
| Acenaphthylene | 0 | ND | 10.1 | | 0 | ND |
| Acenaphthene | 39.9 | | 15.5 | | 23.3 | |
| Fluorene | 18.0 | | 70.1 | | 142.2 | |
| C1-Fluorenes | 69.2 | | 255.0 | | 563.5 | |
| C2-Fluorenes | 94.7 | | 410.2 | | 971.5 | |
| C3-Fluorenes | 66.0 | | 397.6 | | 717.2 | |
| Phenanthrene | 75.2 | | 592.4 | | 647.4 | |
| Anthracene | 4.5 | | 15.7 | | 16.7 | |
| C1-Phen/Anthracenes | 83.7 | | 1616.8 | | 2230.2 | |
| C2-Phen/Anthracenes | 102.7 | | 1785.9 | | 2254.8 | |
| C3-Phen/Anthracenes | 244.9 | | 760.6 | | 990.0 | |
| C4-Phen/Anthracenes | 50.7 | | 230.0 | | 222.2 | |
| Dibenzothiophene | 13.1 | | 65.8 | | 45.4 | |
| C1-Dibenzothiophenes | 47.8 | | 186.8 | | 185.0 | |
| C2-Dibenzothiophenes | 46.3 | | 279.4 | | 326.8 | |
| C3-Dibenzothiophenes | 80.6 | | 268.5 | | 289.6 | |
| Fluoranthene | 19.6 | | 74.4 | | 61.5 | |
| Pyrene | 18.0 | | 95.3 | | 109.8 | |
| C1-Fluoranthene/Pyrenes | 0 | ND | 269.9 | | 347.4 | |
| Benzo(a)anthracene | 3.1 | J | 8.8 | | 14.3 | |
| Chrysene | 6.3 | J | 35.2 | | 59.6 | |
| C1-Chrysenes | 29.6 | | 44.2 | | 95.5 | |
| C2-Chrysenes | 0 | ND | 40.3 | | 76.9 | |
| C3-Chrysenes | 0 | ND | 0 | ND | 12.3 | J |
| C4-Chrysenes | 0 | ND | 0 | ND | 12.8 | J |
| Benzo(b)fluoranthene | 2.0 | J | 9.5 | | 8.2 | |
| Benzo(k)fluoranthene | 15.1 | | 4.2 | | 3.4 | J |
| Benzo(e)pyrene | 2.0 | J | 11.1 | | 5.9 | |
| Benzo(a)pyrene | 1.5 | J | 7.7 | | 4.0 | J |
| Perylene | 3.4 | J | 24.0 | | 14.6 | |
| Indeno(1,2,3-c,d)pyrene | 2.4 | J | 7.3 | | 3.4 | J |
| Dibenzo(a,h)anthracene | 0 | ND | 4.4 | | 1.8 | J |
| Benzo(g,h,i)perylene | 3.2 | | 9.9 | | 7.2 | |
| **TOTAL PAH (ng/SPMD) (Excluding Perylene)** | **2,443.4** | | **11,949.6** | | **16,458.9** | |
| **Specific Isomers (ng/SPMD)** | | | | | | |
| 1-Methylnaphthalene | 94.3 | | 374.3 | | 464.3 | |
| 2-Methylnaphthalene | 134.5 | | 395.8 | | 484.9 | |
| 2,6-Dimethylnaphthalene | 75.4 | | 305.0 | | 503.9 | |
| 1,6,7-Trimethylnaphthalene | 23.8 | | 254.4 | | 488.0 | |
| 1-Methylphenanthrene | 15.6 | | 420.1 | | 584.4 | |
| **Surrogate Recoveries (%)** | | | | | | |
| Naphthalene-d8 | 60.0 | | 58.1 | | 81.4 | |
| Acenapthene-d10 | 73.8 | | 78.9 | | 83.4 | |
| Phenanthrene-d10 | 67.4 | | 30.8 | M | 61.9 | |
| Chrysene-d12 | 59.7 | | 63.3 | | 79.2 | |
| Perylene-d12 | 51.0 | | 39.5 | M | 48.5 | |
| **Total Hydrocarbon (THC in mg/SPMD)** | **0.36** | | **0.63** | | **0.54** | |

# APPENDIX C

## SPMD Results

## 2.0 PAH Quality Control Data

# PAH Quality Control Data for Cook Inlet 1995 EMP

| | LAB BLANK | LAB BLANK | SOLVENT BLANK |
|---|---|---|---|
| QC Sample Type | LAB BLANK | LAB BLANK | SOLVENT BLANK |
| Lab Sample ID | C21925 | C21926 | C21927 |

**ASSOCIATED SAMPLE INFORMATION**

| | C21925 | C21926 | C21927 |
|---|---|---|---|
| Station / Survey / Rep / KLI Sample ID | USE BATCH INFO | USE BATCH INFO | USE BATCH INFO |
| Matrix: | SPMD | SPMD | SPMD |
| Sample Type: | | | |
| Batch: | M1609 | M1609 | M1609 |
| Wet weight (g) | N/A | N/A | N/A |
| Dry weight (g) | N/A | N/A | N/A |
| Solids (%) | N/A | N/A | N/A |

| ANALYTE (ng/SPMD) | C21925 Value | Qual | C21926 Value | Qual | C21927 Value | Qual |
|---|---|---|---|---|---|---|
| Naphthalene | 183.7 | | 146.6 | | 31.9 | |
| C1-Naphthalenes | 145.7 | | 90.6 | | 0 | ND |
| C2-Naphthalenes | 97.3 | | 141.6 | | 0 | ND |
| C3-Naphthalenes | 0 | ND | 109.6 | | 0 | ND |
| C4-Naphthalenes | 0 | ND | 107 | | 0 | ND |
| Biphenyl | 29.9 | | 30.6 | | 0 | ND |
| Acenaphthylene | 0 | ND | 6.3 | J | 0 | ND |
| Acenaphthene | 15.8 | | 31.7 | | 0 | ND |
| Fluorene | 4.5 | J | 13.9 | | 0 | ND |
| C1-Fluorenes | 38.3 | | 290.5 | | 0 | ND |
| C2-Fluorenes | 0 | ND | 485.7 | | 0 | ND |
| C3-Fluorenes | 0 | ND | 563.8 | | 0 | ND |
| Phenanthrene | 20.9 | | 143.5 | | 11.3 | |
| Anthracene | 3 | | 7.6 | | 2.7 | |
| C1-Phen/Anthracenes | 27.2 | J | 106 | | 0 | ND |
| C2-Phen/Anthracenes | 35.4 | | 138.4 | | 0 | ND |
| C3-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Phen/Anthracenes | 0 | ND | 0 | ND | 0 | ND |
| Dibenzothiophene | 3.7 | | 18.8 | | 0 | ND |
| C1-Dibenzothiophenes | 16.5 | | 64.9 | | 0 | ND |
| C2-Dibenzothiophenes | 24 | | 95.3 | | 0 | ND |
| C3-Dibenzothiophenes | 38.8 | | 131.3 | | 0 | ND |
| Fluoranthene | 4.2 | | 20.3 | | 5.3 | |
| Pyrene | 8.4 | | 32.4 | | 21.1 | |
| C1-Fluoranthene/Pyrenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(a)anthracene | 0.8 | J | 22.8 | | 0.1 | J |
| Chrysene | 2.9 | J | 2.6 | J | 1.3 | J |
| C1-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C2-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C3-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| C4-Chrysenes | 0 | ND | 0 | ND | 0 | ND |
| Benzo(b)fluoranthene | 2 | J | 4.6 | | 0 | ND |
| Benzo(k)fluoranthene | 1.5 | J | 3.4 | J | 0 | ND |
| Benzo(e)pyrene | 4.5 | | 3.6 | | 0 | ND |
| Benzo(a)pyrene | 3.9 | J | 4.3 | J | 0 | ND |
| Perylene | 4.6 | J | 4.5 | J | 0 | ND |
| Indeno(1,2,3-c,d)pyrene | 2.3 | J | 0 | ND | 0 | ND |
| Dibenzo(a,h)anthracene | 0 | ND | 0 | ND | 0 | ND |
| Benzo(g,h,i)perylene | 3.1 | | 5.5 | | 0 | ND |
| **TOTAL PAH** (ng/SPMD) (Excluding Perylene) | **718.3** | | **2,823.2** | | **73.7** | |

| Specific Isomers (ng/SPMD) | C21925 | Qual | C21926 | Qual | C21927 | Qual |
|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 67.4 | | 39.6 | | 0 | ND |
| 2-Methylnaphthalene | 78.3 | | 51 | | 0 | ND |
| 2,6-Dimethylnaphthalene | 30.1 | | 53.2 | | 0 | ND |
| 1,6,7-Trimethylnaphthalene | 26.9 | | 18.5 | | 0 | ND |
| 1-Methylphenanthrene | 2.8 | J | 15.2 | | 0 | ND |

| Surrogate Recoveries (%) | C21925 | Qual | C21926 | Qual | C21927 | Qual |
|---|---|---|---|---|---|---|
| Naphthalene-d8 | 54.1 | | 73.4 | | 115.8 | |
| Acenapthene-d10 | 62 | | 60.8 | | 107.3 | |
| Phenanthrene-d10 | 95.6 | | 147.5 | M | 6.8 | M |
| Chrysene-d12 | 51.4 | | 52.1 | | 91.6 | |
| Perylene-d12 | 43.4 | | 32.2 | M | 136.8 | M |

| | C21925 | C21926 | C21927 |
|---|---|---|---|
| Total Hydrocarbon (THC in mg/SPMD) | **0.05** | **0.05** | **0.02** |

# PAH Quality Control Data for Cook Inlet 1995 EMP

| QC Sample Type | Lab Sample ID | QC Sample Type | Lab Sample ID |
|---|---|---|---|
| PROC BLANK | Q10984 | REFERENCE OIL | W4332 |

**ASSOCIATED SAMPLE INFORMATION**

| Station | Survey | Rep | KLI Sample ID |
|---|---|---|---|
| | | | USE BATCH INFO |

## PROC BLANK (Q10984)

Matrix: SOLVENT
Sample Type:
Batch: M1609

Wet weight (g) N/A
Dry weight (g) N/A
Solids (%) N/A

| ANALYTE | Value | Qual |
|---|---|---|
| Naphthalene | 12.1 | |
| C1-Naphthalenes | 0 | ND |
| C2-Naphthalenes | 0 | ND |
| C3-Naphthalenes | 0 | ND |
| C4-Naphthalenes | 0 | ND |
| Biphenyl | 0 | ND |
| Acenaphthylene | 0 | ND |
| Acenaphthene | 0 | ND |
| Fluorene | 0 | ND |
| C1-Fluorenes | 0 | ND |
| C2-Fluorenes | 0 | ND |
| C3-Fluorenes | 0 | ND |
| Phenanthrene | 10 | |
| Anthracene | 4.3 | |
| C1-Phen/Anthracenes | 0 | ND |
| C2-Phen/Anthracenes | 0 | ND |
| C3-Phen/Anthracenes | 0 | ND |
| C4-Phen/Anthracenes | 0 | ND |
| Dibenzothiophene | 4.4 | |
| C1-Dibenzothiophenes | 0 | ND |
| C2-Dibenzothiophenes | 0 | ND |
| C3-Dibenzothiophenes | 0 | ND |
| Fluoranthene | 1.6 | J |
| Pyrene | 3.3 | J |
| C1-Fluoranthene/Pyrenes | 0 | ND |
| Benzo(a)anthracene | 0 | ND |
| Chrysene | 0 | ND |
| C1-Chrysenes | 0 | ND |
| C2-Chrysenes | 0 | ND |
| C3-Chrysenes | 0 | ND |
| C4-Chrysenes | 0 | ND |
| Benzo(b)fluoranthene | 0 | ND |
| Benzo(k)fluoranthene | 0 | ND |
| Benzo(e)pyrene | 0 | ND |
| Benzo(a)pyrene | 0 | ND |
| Perylene | 0 | ND |
| Indeno(1,2,3-c,d)pyrene | 0 | ND |
| Dibenzo(a,h)anthracene | 0 | ND |
| Benzo(g,h,i)perylene | 0 | ND |
| **TOTAL PAH** (Excluding Perylene) | **35.7** | |
| **Specific Isomers** | | |
| 1-Methylnaphthalene | 0 | ND |
| 2-Methylnaphthalene | 0 | ND |
| 2,6-Dimethylnaphthalene | 0 | ND |
| 1,6,7-Trimethylnaphthalene | 0 | ND |
| 1-Methylphenanthrene | 0 | ND |
| **Surrogate Recoveries (%)** | | |
| Naphthalene-d8 | 114.1 | |
| Acenapthene-d10 | 80.8 | |
| Phenanthrene-d10 | 90.6 | |
| Chrysene-d12 | 64.8 | |
| Perylene-d12 | 53.8 | |
| Total Hydrocarbon | 0.01 | |

## REFERENCE OIL (W4332)

Matrix: OIL
Sample Type:
Batch: M1609

Wet weight (g) N/A
Dry weight (g) N/A
Solids (%) N/A

| ANALYTE | Value | Qual |
|---|---|---|
| Naphthalene | 502 | Y |
| C1-Naphthalenes | 2222.7 | Y |
| C2-Naphthalenes | 1960.7 | Y |
| C3-Naphthalenes | 1581.3 | Y |
| C4-Naphthalenes | 941.6 | Y |
| Biphenyl | 207.5 | Y |
| Acenaphthylene | 2.1 | J |
| Acenaphthene | 16.2 | J |
| Fluorene | 99.5 | Y |
| C1-Fluorenes | 286.1 | Y |
| C2-Fluorenes | 447.5 | Y |
| C3-Fluorenes | 493.2 | Y |
| Phenanthrene | 290.8 | Y |
| Anthracene | 8.6 | J |
| C1-Phen/Anthracenes | 667.7 | Y |
| C2-Phen/Anthracenes | 735.2 | Y |
| C3-Phen/Anthracenes | 712.9 | Y |
| C4-Phen/Anthracenes | 197.5 | Y |
| Dibenzothiophene | 215.5 | Y |
| C1-Dibenzothiophenes | 443.8 | Y |
| C2-Dibenzothiophenes | 639.4 | Y |
| C3-Dibenzothiophenes | 640.1 | Y |
| Fluoranthene | 5.6 | J |
| Pyrene | 12.1 | J |
| C1-Fluoranthene/Pyrenes | 85.9 | Y |
| Benzo(a)anthracene | 5.7 | J |
| Chrysene | 44.6 | Y |
| C1-Chrysenes | 120.7 | Y |
| C2-Chrysenes | 186.8 | Y |
| C3-Chrysenes | 36.3 | Y |
| C4-Chrysenes | 23 | Y |
| Benzo(b)fluoranthene | 7.1 | J |
| Benzo(k)fluoranthene | 0.7 | J |
| Benzo(e)pyrene | 13.3 | J |
| Benzo(a)pyrene | 2.1 | J |
| Perylene | 0.5 | J |
| Indeno(1,2,3-c,d)pyrene | 1.2 | J |
| Dibenzo(a,h)anthracene | 2.1 | J |
| Benzo(g,h,i)perylene | 3.9 | J |
| **TOTAL PAH** (ng/g) (Excluding Perylene) | **13,863.1** | |
| **Specific Isomers** (ng/g) | | |
| 1-Methylnaphthalene | 992.1 | Y |
| 2-Methylnaphthalene | 1230.5 | Y |
| 2,6-Dimethylnaphthalene | 896.9 | Y |
| 1,6,7-Trimethylnaphthalene | 490.3 | Y |
| 1-Methylphenanthrene | 200 | Y |
| **Surrogate Recoveries (%)** | | |
| Naphthalene-d8 | .NULL. | |
| Acenapthene-d10 | .NULL. | |
| Phenanthrene-d10 | .NULL. | |
| Chrysene-d12 | .NULL. | |
| Perylene-d12 | .NULL. | |
| Total Hydrocarbon (THC in µg/g) | N/A | |

# APPENDIX D

## Fish Results

## 1.0 Trawl Data

# Fish Trawl Data for Cook Inlet 1995 EMP

| Station | Trawl No. | Date | Time | Common Name | Taxon | Total # Fish | Comments |
|---|---|---|---|---|---|---|---|
| KAMIB-T | 1b[a] | 6/20/95 | 20:21 | Armorhead Sculpin | *Gymnocanthus galeatus* | 4 | |
| | | | | Fantail Sole | *Xystreurys liolepis* | 3 | |
| | | | | Pacific Cod | *Gadus macrocephalus* | 4 | |
| | | | | Pacific Halibut | *Hippoglossus stenolepis* | 11 | |
| | | | | Pacific Spiny Lumpsucker | *Eumicrotremus orbis* | 1 | |
| | | | | Ribbed Sculpin | *Triglops pingeli* | 6 | |
| | | | | Rock Sole | *Pleuronectes bilineatus* | 8 | many parasites |
| | | | | Threaded Sculpin | *Gymnocanthus pistilliger* | 37 | |
| | | | | Whitespotted Greenling | *Hexagrammos stelleri* | 3 | |
| | | | | Yellow Irish Lord | *Hemilepidotus jordani* | 4 | |
| | 2 | 6/20/95 | 21:16 | Armorhead Sculpin | *Gymnocanthus galeatus* | 13 | |
| | | | | Fantail Sole | *Xystreurys liolepis* | 3 | |
| | | | | Pacific Cod | *Gadus macrocephalus* | 6 | |
| | | | | Pacific Halibut | *Hippoglossus stenolepis* | 17 | |
| | | | | Red Irish Lord | *Hemilepidotus hemilepidotus* | 2 | |
| | | | | Ribbed Sculpin | *Triglops pingeli* | 3 | |
| | | | | Rock Sole | *Pleuronectes bilineatus* | 16 | |
| | | | | Whitespotted Greenling | *Hexagrammos stelleri* | 6 | |
| | 3b[b] | 6/20/95 | 22:17 | Armorhead Sculpin | *Gymnocanthus galeatus* | 3 | |
| | | | | Rock Sole | *Pleuronectes bilineatus* | 7 | |
| KACHB-T | 1 | 6/22/95 | 11:06 | Alaskan Plaice | *Pleuronectes quadrituberculatus* | 1 | |
| | | | | Flathead Sole | *Hippoglossoides elassodon* | 3 | |
| | | | | Rock Sole | *Pleuronectes bilineatus* | 2 | |
| | 2 | 6/22/95 | 11:41 | Rock Sole | *Pleuronectes bilineatus* | 2 | |
| | 3 | 6/22/95 | 12:02 | Armorhead Sculpin | *Gymnocanthus galeatus* | 1 | |
| | | | | Fantail Sole | *Xystreurys liolepis* | 2 | |
| | | | | Flathead Sole | *Hippoglossoides elassodon* | 2 | |
| EFORE-T | 3 | 6/23/95 | 13:22 | Hooligan | *Thaleichthys pacificus* | 1 | No fish in trawls 1 or 2 |
| TRADB-T | 1 | 6/23/95 | 20:48 | Hooligan | *Thaleichthys pacificus* | 2 | |
| | 2 | 6/23/95 | 21:07 | Wattled Eelpout | *Lycodes palearis* | 1 | No fish in trawl 3 |

[a] Trawl 1a empty except for some jellyfish.

[b] Trawl 3a hung up on rocky area. Trawl 3b lost some of catch due to torn mesh upon retrieval.

Two attempts were made to trawl at Southeast Kamishak Bay. Trawling was discontinued due to rocky bottom.

# APPENDIX D

## Fish Results

## 2.0 Bile Metabolite Data

# APPENDIX D

## Fish Results

## 3.0 Liver EROD and AHH Data

## Bile Metabolite Data for Cook Inlet 1995 EMP

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0001 | C21677 | 24000 | 6600 | < 100 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0002 | C21678 | 15000 | 2900 | < 100 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0003 | C21679 | 15000 | 2400 | < 100 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0004 | C21680 | 7000 | 990 | < 100 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0005 | C21681 | 9000 | 1300 | < 100 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0006 | C21682 | 14000 | 2200 | < 100 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0007 | C21683 | 7600 | 1100 | < 100 |

## Bile Metabolite Data for Cook Inlet 1995 EMP

**STATION ID:** KAMIB-F **SURVEY:** 2 **TAXON:** *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0009 | C21685 | 9700 | 1400 | < 100 |

**STATION ID:** KAMIB-L **SURVEY:** 2 **TAXON:** *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0008 | C21684 | 14000 | 2700 | < 100 |

**STATION ID:** KAMIB-L **SURVEY:** 2 **TAXON:** *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0011 | C21686 | 9300 | 1200 | < 100 |

**STATION ID:** KAMIB-L **SURVEY:** 2 **TAXON:** *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0012 | C21687 | 8600 | 1300 | < 100 |

**STATION ID:** KAMIB-L **SURVEY:** 2 **TAXON:** *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0013 | C21688 | 12000 | 1800 | < 100 |

**STATION ID:** KAMIB-L **SURVEY:** 2 **TAXON:** *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0014 | C21689 | 9500 | 1300 | < 100 |

**STATION ID:** KAMIB-L **SURVEY:** 2 **TAXON:** *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | Naphthalene (ng/g) | Phenanthrene (ng/g) | Benzo(a)pyrene (ng/g) |
|---|---|---|---|---|
| CIR95BIL0015 | C21690 | 7600 | 990 | < 100 |

## Cytochrome P4501A Induction Data for Cook Inlet 1995 EMP

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
|---|---|---|---|---|
| CIR95LIV0001 | C21663 | 55 | 76 | 85 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
|---|---|---|---|---|
| CIR95LIV0002 | C21664 | 70 | 93 | 88 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
|---|---|---|---|---|
| CIR95LIV0003 | C21665 | 41 | 60 | 86 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
|---|---|---|---|---|
| CIR95LIV0004 | C21666 | 76 | 114 | 92 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
|---|---|---|---|---|
| CIR95LIV0005 | C21667 | 57 | 89 | 100 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
|---|---|---|---|---|
| CIR95LIV0006 | C21668 | 43 | 51 | 42 |

STATION ID: KACHB-L SURVEY: 2 TAXON: *Hippoglossus stenolepis*

| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
|---|---|---|---|---|
| CIR95LIV0007 | C21669 | 58 | 91 | 117 |

# Cytochrome P4501A Induction Data for Cook Inlet 1995 EMP

| STATION ID: | KAMIB-F | SURVEY: | 2 | TAXON: *Hippoglossus stenolepis* |
|---|---|---|---|---|
| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
| CIR95LIV0009 | C21671 | 49 | 64 | 56 |

| STATION ID: | KAMIB-L | SURVEY: | 2 | TAXON: *Hippoglossus stenolepis* |
|---|---|---|---|---|
| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
| CIR95LIV0008 | C21670 | 13 | 19 | 35 |

| STATION ID: | KAMIB-L | SURVEY: | 2 | TAXON: *Hippoglossus stenolepis* |
|---|---|---|---|---|
| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
| CIR95LIV0011 | C21672 | 30 | 32 | 28 |

| STATION ID: | KAMIB-L | SURVEY: | 2 | TAXON: *Hippoglossus stenolepis* |
|---|---|---|---|---|
| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
| CIR95LIV0012 | C21673 | 34 | 56 | 52 |

| STATION ID: | KAMIB-L | SURVEY: | 2 | TAXON: *Hippoglossus stenolepis* |
|---|---|---|---|---|
| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
| CIR95LIV0013 | C21674 | 40 | 64 | 88 |

| STATION ID: | KAMIB-L | SURVEY: | 2 | TAXON: *Hippoglossus stenolepis* |
|---|---|---|---|---|
| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
| CIR95LIV0014 | C21675 | 40 | 52 | 64 |

| STATION ID: | KAMIB-L | SURVEY: | 2 | TAXON: *Hippoglossus stenolepis* |
|---|---|---|---|---|
| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
| CIR95LIV0015 | C21677 | 29 | 34 | 25 |

## Cytochrome P4501A Induction Data for Cook Inlet 1995 EMP

**STATION ID:** KACHB-L **SURVEY:** 2 **TAXON:** *Pleuronectes bilineatus*

| Sample ID | Labsamp ID | EROD at 25° C (pmol/min/mg) | EROD at 30° C (pmol/min/mg) | AHH at 25° C (pmol/min/mg) |
|---|---|---|---|---|
| CIR95LIV0010 | C22131 | 25 | 27 | .NULL. |

# APPENDIX E

## Hydrographic Results

### 1.0 CTD Data

## Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** EFORE-H **SURVEY:** 1 CAST DATE: 6/23/95 CAST TIME (ADT):11:13

**STATION LOCATION** Latitude (N) 60° 45' 36.70" Longitude (W) 151° 17' 5.40"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0001 | 1.00 | 10.6 | 22.9 | 7.9 | 9.1 | 0.0 |
| CIR95CTD0002 | 1.50 | 10.6 | 22.9 | 7.9 | 9.2 | 0.0 |
| CIR95CTD0003 | 2.00 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0004 | 2.50 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0005 | 3.00 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0006 | 3.50 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0007 | 4.00 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0008 | 4.50 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0009 | 5.00 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0010 | 5.50 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0011 | 6.00 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0012 | 6.50 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0013 | 7.00 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |
| CIR95CTD0014 | 7.50 | 10.6 | 23.0 | 7.9 | 9.6 | 0.0 |

# Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** EFORE-H **SURVEY:** 2 CAST DATE: 7/25/95 CAST TIME (ADT):21:34

**STATION LOCATION** Latitude (N) 60° 46' 15.10" Longitude (W) 151° 16' 44.00"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0423 | 0.50 | 13.9 | 19.9 | 8.1 | 8.5 | 0.0 |
| CIR95CTD0424 | 1.00 | 13.8 | 20.0 | 8.1 | 8.7 | 0.0 |
| CIR95CTD0425 | 1.50 | 13.8 | 20.0 | 8.0 | 8.7 | 0.0 |
| CIR95CTD0426 | 2.00 | 13.7 | 20.1 | 8.0 | 8.5 | 0.0 |
| CIR95CTD0427 | 2.50 | 13.7 | 20.1 | 8.0 | 8.5 | 0.0 |
| CIR95CTD0428 | 3.00 | 13.8 | 20.0 | 8.1 | 8.5 | 0.0 |
| CIR95CTD0429 | 3.50 | 13.8 | 20.0 | 8.1 | 8.5 | 0.0 |
| CIR95CTD0430 | 4.00 | 13.8 | 20.0 | 8.1 | 8.5 | 0.0 |
| CIR95CTD0431 | 4.50 | 13.6 | 20.2 | 8.1 | 8.5 | 0.0 |
| CIR95CTD0432 | 5.00 | 13.5 | 20.4 | 8.1 | 8.6 | 0.0 |
| CIR95CTD0433 | 5.50 | 13.5 | 20.3 | 8.1 | 8.6 | 0.0 |
| CIR95CTD0434 | 6.00 | 13.5 | 20.3 | 8.0 | 8.6 | 0.0 |
| CIR95CTD0435 | 6.50 | 13.4 | 20.4 | 8.1 | 8.6 | 0.0 |
| CIR95CTD0436 | 7.00 | 13.4 | 20.5 | 8.0 | 8.5 | 0.0 |
| CIR95CTD0437 | 7.50 | 13.4 | 20.5 | 8.0 | 8.6 | 0.0 |
| CIR95CTD0438 | 8.00 | 13.4 | 20.5 | 8.1 | 8.6 | 0.0 |
| CIR95CTD0439 | 8.50 | 13.4 | 20.5 | 8.0 | 8.6 | 0.0 |
| CIR95CTD0440 | 9.00 | 13.4 | 20.5 | 8.0 | 8.6 | 0.0 |
| CIR95CTD0441 | 9.50 | 13.4 | 20.5 | 8.0 | 8.5 | 0.0 |
| CIR95CTD0442 | 10.00 | 13.4 | 20.5 | 8.0 | 8.6 | 0.0 |
| CIR95CTD0443 | 10.50 | 13.4 | 20.5 | 8.0 | 8.6 | 0.0 |
| CIR95CTD0444 | 11.00 | 13.4 | 20.5 | 8.0 | 8.6 | 0.0 |
| CIR95CTD0445 | 11.50 | 13.4 | 20.5 | 8.0 | 8.7 | 0.0 |
| CIR95CTD0446 | 12.00 | 13.4 | 20.6 | 8.0 | 8.7 | 0.0 |
| CIR95CTD0447 | 12.50 | 13.4 | 20.6 | 8.0 | 8.9 | 0.0 |
| CIR95CTD0448 | 13.00 | 13.4 | 20.6 | 8.0 | 9.0 | 0.0 |

# Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** KAMIB-H **SURVEY:** 1 CAST DATE: 6/21/95 CAST TIME (ADT):11:11

**STATION LOCATION** Latitude (N) 59° 22' 36.40" Longitude (W) 153° 46' 0.60"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0049 | 0.00 | 10.1 | 29.7 | 8.2 | 9.4 | 76.5 |
| CIR95CTD0050 | 0.50 | 10.0 | 29.5 | 8.2 | 9.7 | 72.3 |
| CIR95CTD0051 | 1.00 | 9.9 | 29.4 | 8.2 | 9.9 | 67.4 |
| CIR95CTD0052 | 1.50 | 9.7 | 29.6 | 8.2 | 9.9 | 68.3 |
| CIR95CTD0053 | 2.00 | 9.6 | 29.6 | 8.2 | 9.9 | 67.3 |
| CIR95CTD0054 | 2.50 | 9.5 | 29.6 | 8.2 | 9.9 | 66.2 |
| CIR95CTD0055 | 3.00 | 9.4 | 29.6 | 8.2 | 10.0 | 65.2 |
| CIR95CTD0056 | 3.50 | 9.3 | 29.6 | 8.2 | 9.9 | 64.6 |
| CIR95CTD0057 | 4.00 | 9.3 | 29.7 | 8.1 | 9.9 | 63.9 |
| CIR95CTD0058 | 4.50 | 9.1 | 29.8 | 8.1 | 9.8 | 64.6 |
| CIR95CTD0059 | 5.00 | 9.0 | 29.8 | 8.1 | 9.7 | 64.4 |
| CIR95CTD0060 | 5.50 | 9.0 | 29.8 | 8.1 | 9.7 | 63.9 |
| CIR95CTD0061 | 6.00 | 8.9 | 29.9 | 8.1 | 9.7 | 65.2 |
| CIR95CTD0062 | 6.50 | 8.9 | 29.9 | 8.1 | 9.6 | 66.4 |
| CIR95CTD0063 | 7.00 | 8.9 | 29.9 | 8.1 | 9.6 | 66.9 |
| CIR95CTD0064 | 7.50 | 8.9 | 29.9 | 8.1 | 9.6 | 67.5 |
| CIR95CTD0065 | 8.00 | 8.8 | 29.9 | 8.1 | 9.6 | 68.1 |
| CIR95CTD0066 | 8.50 | 8.8 | 29.9 | 8.1 | 9.7 | 68.2 |
| CIR95CTD0067 | 9.00 | 8.7 | 30.0 | 8.1 | 9.5 | 68.1 |
| CIR95CTD0068 | 9.50 | 8.6 | 30.0 | 8.1 | 9.6 | 68.1 |
| CIR95CTD0069 | 10.00 | 8.5 | 30.1 | 8.1 | 9.6 | 67.8 |
| CIR95CTD0070 | 10.50 | 8.4 | 30.1 | 8.1 | 9.6 | 67.4 |
| CIR95CTD0071 | 11.00 | 8.4 | 30.1 | 8.1 | 9.5 | 67.1 |
| CIR95CTD0072 | 11.50 | 8.3 | 30.2 | 8.1 | 9.6 | 66.6 |
| CIR95CTD0073 | 12.00 | 8.2 | 30.2 | 8.1 | 9.5 | 66.2 |
| CIR95CTD0074 | 12.50 | 8.1 | 30.3 | 8.1 | 9.6 | 65.7 |
| CIR95CTD0075 | 13.00 | 8.0 | 30.3 | 8.1 | 9.5 | 64.7 |
| CIR95CTD0076 | 13.50 | 8.0 | 30.3 | 8.1 | 9.6 | 64.3 |
| CIR95CTD0077 | 14.00 | 8.0 | 30.3 | 8.1 | 9.5 | 63.4 |
| CIR95CTD0078 | 14.50 | 7.9 | 30.4 | 8.1 | 9.5 | 61.4 |
| CIR95CTD0079 | 15.00 | 7.9 | 30.4 | 8.1 | 9.5 | 60.4 |
| CIR95CTD0080 | 15.50 | 7.9 | 30.4 | 8.1 | 9.5 | 58.4 |
| CIR95CTD0081 | 16.00 | 7.9 | 30.4 | 8.1 | 9.5 | 58.3 |
| CIR95CTD0082 | 16.50 | 7.9 | 30.4 | 8.1 | 9.5 | 58.8 |
| CIR95CTD0083 | 17.00 | 7.9 | 30.4 | 8.1 | 9.5 | 59.3 |

# Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** KAMIB-H **SURVEY:** 2 CAST DATE: 7/29/95 CAST TIME (ADT):17:04

**STATION LOCATION** Latitude (N) 59° 22' 34.60" Longitude (W) 153° 46' 15.40"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0470 | 0.50 | 11.1 | 29.9 | 8.2 | 9.4 | 63.5 |
| CIR95CTD0471 | 1.00 | 11.1 | 29.9 | 8.2 | 9.4 | 63.4 |
| CIR95CTD0472 | 1.50 | 11.1 | 29.9 | 8.2 | 9.4 | 63.4 |
| CIR95CTD0473 | 2.00 | 11.1 | 29.9 | 8.2 | 9.3 | 63.8 |
| CIR95CTD0474 | 2.50 | 11.1 | 29.9 | 8.2 | 9.4 | 63.8 |
| CIR95CTD0475 | 3.00 | 11.1 | 29.9 | 8.2 | 9.3 | 63.9 |
| CIR95CTD0476 | 3.50 | 11.1 | 30.0 | 8.2 | 9.4 | 64.3 |
| CIR95CTD0477 | 4.00 | 11.1 | 30.0 | 8.2 | 9.4 | 64.5 |
| CIR95CTD0478 | 4.50 | 11.1 | 30.0 | 8.2 | 9.4 | 64.6 |
| CIR95CTD0479 | 5.00 | 11.1 | 30.0 | 8.2 | 9.4 | 64.5 |
| CIR95CTD0480 | 5.50 | 11.1 | 30.0 | 8.2 | 9.5 | 64.7 |
| CIR95CTD0481 | 6.00 | 11.1 | 30.0 | 8.2 | 9.5 | 64.7 |
| CIR95CTD0482 | 6.50 | 11.0 | 30.0 | 8.2 | 9.5 | 64.4 |
| CIR95CTD0483 | 7.00 | 11.0 | 30.0 | 8.2 | 9.5 | 64.3 |
| CIR95CTD0484 | 7.50 | 11.0 | 30.0 | 8.2 | 9.5 | 64.5 |
| CIR95CTD0485 | 8.00 | 11.0 | 30.0 | 8.2 | 9.5 | 64.9 |
| CIR95CTD0486 | 8.50 | 11.0 | 30.0 | 8.2 | 9.4 | 64.8 |
| CIR95CTD0487 | 9.00 | 11.0 | 30.0 | 8.2 | 9.5 | 64.5 |
| CIR95CTD0488 | 9.50 | 11.0 | 30.0 | 8.2 | 9.5 | 64.5 |
| CIR95CTD0489 | 10.00 | 11.0 | 30.0 | 8.2 | 9.5 | 64.4 |
| CIR95CTD0490 | 10.50 | 11.0 | 30.0 | 8.2 | 9.5 | 64.4 |
| CIR95CTD0491 | 11.00 | 11.0 | 30.0 | 8.2 | 9.6 | 64.3 |
| CIR95CTD0492 | 11.50 | 11.0 | 30.0 | 8.2 | 9.6 | 64.2 |
| CIR95CTD0493 | 12.00 | 11.0 | 30.0 | 8.2 | 9.5 | 64.4 |
| CIR95CTD0494 | 12.50 | 11.0 | 29.9 | 8.2 | 9.4 | 65.0 |
| CIR95CTD0495 | 13.00 | 11.0 | 30.0 | 8.2 | 9.7 | 64.2 |
| CIR95CTD0496 | 13.50 | 11.0 | 30.0 | 8.2 | 9.7 | 64.3 |
| CIR95CTD0497 | 14.00 | 11.0 | 30.0 | 8.2 | 9.7 | 64.7 |
| CIR95CTD0498 | 14.50 | 11.0 | 30.0 | 8.2 | 9.7 | 64.6 |
| CIR95CTD0499 | 15.00 | 11.0 | 30.0 | 8.2 | 9.6 | 64.4 |
| CIR95CTD0500 | 15.50 | 11.0 | 30.0 | 8.2 | 9.7 | 64.3 |
| CIR95CTD0501 | 16.00 | 11.0 | 30.0 | 8.2 | 9.7 | 64.7 |
| CIR95CTD0502 | 16.50 | 11.0 | 30.0 | 8.2 | 9.7 | 64.6 |
| CIR95CTD0503 | 17.00 | 11.0 | 30.0 | 8.2 | 9.7 | 64.6 |
| CIR95CTD0504 | 17.50 | 11.0 | 30.0 | 8.2 | 9.8 | 64.3 |
| CIR95CTD0505 | 18.00 | 11.0 | 30.0 | 8.2 | 9.8 | 64.0 |

## Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** KACHB-H **SURVEY:** 1 CAST DATE: 6/22/95 CAST TIME (ADT):8:47

**STATION LOCATION** Latitude (N) 59° 37' 56.70" Longitude (W) 151° 23' 47.40"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0015 | 0.00 | 9.0 | 29.4 | 8.2 | 11.6 | 76.2 |
| CIR95CTD0016 | 0.50 | 8.9 | 29.9 | 8.2 | 11.5 | 71.8 |
| CIR95CTD0017 | 1.00 | 8.8 | 30.0 | 8.2 | 11.4 | 67.9 |
| CIR95CTD0018 | 1.50 | 8.2 | 30.4 | 8.2 | 11.3 | 64.3 |
| CIR95CTD0019 | 2.00 | 8.1 | 30.4 | 8.2 | 11.2 | 64.8 |
| CIR95CTD0020 | 2.50 | 7.8 | 30.6 | 8.2 | 11.1 | 65.7 |
| CIR95CTD0021 | 3.00 | 7.6 | 30.8 | 8.2 | 11.0 | 65.5 |
| CIR95CTD0022 | 3.50 | 7.5 | 30.7 | 8.2 | 10.7 | 65.3 |
| CIR95CTD0023 | 4.00 | 7.2 | 30.9 | 8.1 | 10.6 | 63.7 |
| CIR95CTD0024 | 4.50 | 7.0 | 30.9 | 8.1 | 10.4 | 60.4 |
| CIR95CTD0025 | 5.00 | 6.7 | 31.1 | 8.1 | 10.2 | 60.1 |
| CIR95CTD0026 | 5.50 | 6.6 | 31.1 | 8.1 | 10.1 | 59.1 |
| CIR95CTD0027 | 6.00 | 6.5 | 31.2 | 8.1 | 10.1 | 64.7 |
| CIR95CTD0028 | 6.50 | 6.4 | 31.2 | 8.1 | 10.1 | 66.9 |
| CIR95CTD0029 | 7.00 | 6.3 | 31.2 | 8.1 | 10.0 | 65.9 |
| CIR95CTD0030 | 7.50 | 6.3 | 31.2 | 8.1 | 10.1 | 66.3 |
| CIR95CTD0031 | 8.00 | 6.3 | 31.2 | 8.1 | 10.1 | 66.1 |
| CIR95CTD0032 | 8.50 | 6.3 | 31.2 | 8.1 | 10.1 | 65.8 |
| CIR95CTD0033 | 9.00 | 6.3 | 31.2 | 8.1 | 10.1 | 65.5 |
| CIR95CTD0034 | 9.50 | 6.3 | 31.3 | 8.1 | 10.1 | 63.8 |
| CIR95CTD0035 | 10.00 | 6.3 | 31.2 | 8.1 | 10.0 | 63.5 |
| CIR95CTD0036 | 10.50 | 6.3 | 31.3 | 8.1 | 10.0 | 63.7 |
| CIR95CTD0037 | 11.00 | 6.3 | 31.3 | 8.1 | 10.0 | 62.6 |
| CIR95CTD0038 | 11.50 | 6.3 | 31.3 | 8.1 | 10.1 | 61.3 |
| CIR95CTD0039 | 12.00 | 6.3 | 31.3 | 8.1 | 10.0 | 60.5 |
| CIR95CTD0040 | 12.50 | 6.3 | 31.3 | 8.1 | 10.1 | 60.9 |
| CIR95CTD0041 | 13.00 | 6.3 | 31.3 | 8.1 | 10.1 | 60.5 |
| CIR95CTD0042 | 13.50 | 6.3 | 31.3 | 8.1 | 10.0 | 60.6 |
| CIR95CTD0043 | 14.00 | 6.2 | 31.3 | 8.1 | 10.0 | 60.4 |
| CIR95CTD0044 | 14.50 | 6.2 | 31.3 | 8.1 | 10.1 | 60.1 |
| CIR95CTD0045 | 15.00 | 6.2 | 31.3 | 8.1 | 10.1 | 59.8 |
| CIR95CTD0046 | 15.50 | 6.2 | 31.3 | 8.1 | 10.1 | 59.3 |
| CIR95CTD0047 | 16.00 | 6.2 | 31.3 | 8.1 | 10.0 | 58.7 |
| CIR95CTD0048 | 16.50 | 6.2 | 31.3 | 8.1 | 10.1 | 58.5 |

## Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** KACHB-H **SURVEY:** 2 CAST DATE: 7/27/95 CAST TIME (ADT):10:13

**STATION LOCATION** Latitude (N) 59° 38' 4.50" Longitude (W) 151° 23' 57.80"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0449 | 0.50 | 10.6 | 24.3 | 8.1 | 9.6 | 45.8 |
| CIR95CTD0450 | 1.00 | 10.5 | 25.7 | 8.1 | 9.6 | 43.6 |
| CIR95CTD0451 | 1.50 | 10.3 | 26.6 | 8.1 | 9.4 | 37.8 |
| CIR95CTD0452 | 2.00 | 10.1 | 27.6 | 8.1 | 9.5 | 34.0 |
| CIR95CTD0453 | 2.50 | 9.8 | 28.1 | 8.1 | 9.5 | 38.4 |
| CIR95CTD0454 | 3.00 | 9.4 | 29.0 | 8.1 | 9.4 | 46.5 |
| CIR95CTD0455 | 3.50 | 9.2 | 29.4 | 8.1 | 9.5 | 47.4 |
| CIR95CTD0456 | 4.00 | 9.2 | 29.4 | 8.1 | 9.5 | 47.6 |
| CIR95CTD0457 | 4.50 | 9.2 | 29.5 | 8.1 | 9.5 | 47.6 |
| CIR95CTD0458 | 5.00 | 9.1 | 29.6 | 8.1 | 9.3 | 47.6 |
| CIR95CTD0459 | 5.50 | 9.0 | 29.7 | 8.1 | 9.6 | 47.5 |
| CIR95CTD0460 | 6.00 | 9.0 | 29.8 | 8.1 | 9.5 | 47.2 |
| CIR95CTD0461 | 6.50 | 9.0 | 29.8 | 8.1 | 9.5 | 47.3 |
| CIR95CTD0462 | 7.00 | 9.0 | 29.8 | 8.1 | 9.5 | 47.1 |
| CIR95CTD0463 | 7.50 | 8.9 | 29.8 | 8.1 | 9.4 | 47.1 |
| CIR95CTD0464 | 8.00 | 8.8 | 30.0 | 8.1 | 9.4 | 46.5 |
| CIR95CTD0465 | 8.50 | 8.6 | 30.3 | 8.1 | 9.3 | 47.4 |
| CIR95CTD0466 | 9.00 | 8.6 | 30.4 | 8.1 | 9.4 | 48.2 |
| CIR95CTD0467 | 9.50 | 8.5 | 30.4 | 8.1 | 9.3 | 43.8 |
| CIR95CTD0468 | 10.00 | 8.5 | 30.5 | 8.1 | 9.3 | 42.7 |
| CIR95CTD0469 | 10.50 | 8.5 | 30.5 | 8.1 | 9.3 | 42.5 |

# Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** NULLZ-H **SURVEY:** 1 CAST DATE: 6/20/95 CAST TIME (ADT):11:41

**STATION LOCATION** Latitude (N) 59° 4' 58.90" Longitude (W) 152° 48' 58.40"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0084 | 0.50 | 7.1 | 31.5 | 8.1 | 9.7 | 15.2 |
| CIR95CTD0085 | 1.00 | 7.1 | 31.7 | 8.1 | 9.7 | 49.7 |
| CIR95CTD0086 | 1.50 | 7.0 | 31.7 | 8.1 | 9.7 | 75.2 |
| CIR95CTD0087 | 2.00 | 7.0 | 31.7 | 8.1 | 9.7 | 83.7 |
| CIR95CTD0088 | 2.50 | 7.0 | 31.7 | 8.1 | 9.7 | 84.0 |
| CIR95CTD0089 | 3.00 | 7.0 | 31.7 | 8.1 | 9.7 | 84.2 |
| CIR95CTD0090 | 3.50 | 7.0 | 31.7 | 8.1 | 9.7 | 84.3 |
| CIR95CTD0091 | 4.00 | 7.0 | 31.7 | 8.1 | 9.7 | 84.5 |
| CIR95CTD0092 | 4.50 | 7.0 | 31.7 | 8.1 | 9.7 | 84.5 |
| CIR95CTD0093 | 5.00 | 7.0 | 31.7 | 8.1 | 9.7 | 84.5 |
| CIR95CTD0094 | 5.50 | 7.0 | 31.7 | 8.1 | 9.7 | 84.4 |
| CIR95CTD0095 | 6.00 | 7.0 | 31.7 | 8.1 | 9.7 | 84.2 |
| CIR95CTD0096 | 6.50 | 7.0 | 31.7 | 8.1 | 9.7 | 84.4 |
| CIR95CTD0097 | 7.00 | 7.0 | 31.7 | 8.1 | 9.7 | 84.4 |
| CIR95CTD0098 | 7.50 | 7.0 | 31.7 | 8.1 | 9.7 | 84.2 |
| CIR95CTD0099 | 8.00 | 7.0 | 31.7 | 8.1 | 9.7 | 84.0 |
| CIR95CTD0100 | 8.50 | 7.0 | 31.7 | 8.1 | 9.7 | 84.2 |
| CIR95CTD0101 | 9.00 | 7.0 | 31.7 | 8.1 | 9.7 | 84.3 |
| CIR95CTD0102 | 9.50 | 7.0 | 31.7 | 8.1 | 9.7 | 84.0 |
| CIR95CTD0103 | 10.00 | 7.0 | 31.7 | 8.1 | 9.7 | 84.3 |
| CIR95CTD0104 | 10.50 | 7.0 | 31.7 | 8.1 | 9.7 | 84.4 |
| CIR95CTD0105 | 11.00 | 7.0 | 31.7 | 8.1 | 9.7 | 84.1 |
| CIR95CTD0106 | 11.50 | 6.9 | 31.7 | 8.1 | 9.6 | 84.0 |
| CIR95CTD0107 | 12.00 | 6.9 | 31.7 | 8.1 | 9.6 | 84.6 |
| CIR95CTD0108 | 12.50 | 6.9 | 31.8 | 8.1 | 9.7 | 84.7 |
| CIR95CTD0109 | 13.00 | 6.9 | 31.8 | 8.1 | 9.7 | 84.6 |
| CIR95CTD0110 | 13.50 | 6.9 | 31.8 | 8.1 | 9.7 | 84.3 |
| CIR95CTD0111 | 14.00 | 6.9 | 31.8 | 8.1 | 9.7 | 84.7 |
| CIR95CTD0112 | 14.50 | 6.9 | 31.8 | 8.1 | 9.7 | 84.9 |
| CIR95CTD0113 | 15.00 | 6.9 | 31.8 | 8.1 | 9.6 | 85.2 |
| CIR95CTD0114 | 15.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.1 |
| CIR95CTD0115 | 16.00 | 6.9 | 31.8 | 8.1 | 9.7 | 85.3 |
| CIR95CTD0116 | 16.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.2 |
| CIR95CTD0117 | 17.00 | 6.9 | 31.8 | 8.1 | 9.7 | 85.3 |
| CIR95CTD0118 | 17.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.3 |
| CIR95CTD0119 | 18.00 | 6.9 | 31.8 | 8.1 | 9.7 | 85.5 |
| CIR95CTD0120 | 18.50 | 6.9 | 31.8 | 8.1 | 9.7 | 84.6 |
| CIR95CTD0121 | 19.00 | 6.9 | 31.8 | 8.1 | 9.7 | 85.5 |
| CIR95CTD0122 | 19.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.5 |
| CIR95CTD0123 | 20.00 | 6.9 | 31.8 | 8.1 | 9.7 | 85.5 |
| CIR95CTD0124 | 20.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.4 |
| CIR95CTD0125 | 21.00 | 6.9 | 31.8 | 8.1 | 9.7 | 85.5 |
| CIR95CTD0126 | 21.50 | 6.9 | 31.8 | 8.1 | 9.6 | 85.5 |
| CIR95CTD0127 | 22.00 | 6.9 | 31.8 | 8.1 | 9.6 | 85.6 |
| CIR95CTD0128 | 22.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.6 |
| CIR95CTD0129 | 23.00 | 6.9 | 31.8 | 8.1 | 9.6 | 85.6 |
| CIR95CTD0130 | 23.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.7 |
| CIR95CTD0131 | 24.00 | 6.9 | 31.8 | 8.1 | 9.7 | 85.7 |

# Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** NULLZ-H **SURVEY:** 1 CAST DATE: 6/20/95 CAST TIME (ADT):11:41

**STATION LOCATION** Latitude (N) 59° 4' 58.90" Longitude (W) 152° 48' 58.40"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0132 | 24.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.6 |
| CIR95CTD0133 | 25.00 | 6.9 | 31.8 | 8.1 | 9.7 | 85.5 |
| CIR95CTD0134 | 25.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.6 |
| CIR95CTD0135 | 26.00 | 6.9 | 31.8 | 8.1 | 9.7 | 85.6 |
| CIR95CTD0136 | 26.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.6 |
| CIR95CTD0137 | 27.00 | 6.9 | 31.8 | 8.1 | 9.6 | 85.6 |
| CIR95CTD0138 | 27.50 | 6.9 | 31.8 | 8.1 | 9.7 | 85.6 |
| CIR95CTD0139 | 28.00 | 6.9 | 31.8 | 8.1 | 9.7 | 85.7 |
| CIR95CTD0140 | 28.50 | 6.8 | 31.8 | 8.1 | 9.6 | 85.7 |
| CIR95CTD0141 | 29.00 | 6.8 | 31.8 | 8.1 | 9.7 | 85.7 |
| CIR95CTD0142 | 29.50 | 6.8 | 31.8 | 8.1 | 9.6 | 85.8 |
| CIR95CTD0143 | 30.00 | 6.8 | 31.8 | 8.1 | 9.6 | 85.9 |
| CIR95CTD0144 | 30.50 | 6.8 | 31.8 | 8.1 | 9.7 | 85.7 |
| CIR95CTD0145 | 31.00 | 6.8 | 31.8 | 8.1 | 9.7 | 85.9 |
| CIR95CTD0146 | 31.50 | 6.8 | 31.8 | 8.1 | 9.7 | 85.9 |
| CIR95CTD0147 | 32.00 | 6.8 | 31.8 | 8.1 | 9.7 | 86.0 |
| CIR95CTD0148 | 32.50 | 6.8 | 31.8 | 8.1 | 9.7 | 85.9 |
| CIR95CTD0149 | 33.00 | 6.8 | 31.8 | 8.1 | 9.7 | 86.0 |
| CIR95CTD0150 | 33.50 | 6.8 | 31.8 | 8.1 | 9.7 | 86.0 |
| CIR95CTD0151 | 34.00 | 6.8 | 31.8 | 8.1 | 9.6 | 86.0 |
| CIR95CTD0152 | 34.50 | 6.8 | 31.8 | 8.1 | 9.6 | 86.1 |
| CIR95CTD0153 | 35.00 | 6.8 | 31.8 | 8.1 | 9.6 | 86.1 |
| CIR95CTD0154 | 35.50 | 6.8 | 31.8 | 8.1 | 9.6 | 86.2 |
| CIR95CTD0155 | 36.00 | 6.7 | 31.8 | 8.1 | 9.6 | 86.2 |
| CIR95CTD0156 | 36.50 | 6.7 | 31.8 | 8.1 | 9.6 | 86.3 |
| CIR95CTD0157 | 37.00 | 6.7 | 31.9 | 8.1 | 9.6 | 86.3 |
| CIR95CTD0158 | 37.50 | 6.7 | 31.9 | 8.1 | 9.6 | 86.3 |
| CIR95CTD0159 | 38.00 | 6.7 | 31.9 | 8.1 | 9.6 | 86.3 |
| CIR95CTD0160 | 38.50 | 6.7 | 31.9 | 8.1 | 9.6 | 86.4 |
| CIR95CTD0161 | 39.00 | 6.7 | 31.9 | 8.1 | 9.6 | 86.3 |
| CIR95CTD0162 | 39.50 | 6.7 | 31.9 | 8.1 | 9.6 | 86.4 |
| CIR95CTD0163 | 40.00 | 6.7 | 31.9 | 8.1 | 9.6 | 86.4 |
| CIR95CTD0164 | 40.50 | 6.6 | 31.9 | 8.1 | 9.6 | 86.3 |
| CIR95CTD0165 | 41.00 | 6.6 | 31.9 | 8.1 | 9.6 | 86.3 |
| CIR95CTD0166 | 41.50 | 6.6 | 31.9 | 8.1 | 9.6 | 86.5 |
| CIR95CTD0167 | 42.00 | 6.6 | 31.9 | 8.1 | 9.6 | 86.5 |
| CIR95CTD0168 | 42.50 | 6.6 | 31.9 | 8.1 | 9.6 | 86.5 |
| CIR95CTD0169 | 43.00 | 6.6 | 31.9 | 8.1 | 9.6 | 86.5 |
| CIR95CTD0170 | 43.50 | 6.6 | 31.9 | 8.1 | 9.6 | 86.5 |
| CIR95CTD0171 | 44.00 | 6.6 | 31.9 | 8.1 | 9.6 | 86.5 |
| CIR95CTD0172 | 44.50 | 6.6 | 31.9 | 8.1 | 9.6 | 86.6 |
| CIR95CTD0173 | 45.00 | 6.6 | 31.9 | 8.1 | 9.6 | 86.6 |
| CIR95CTD0174 | 45.50 | 6.6 | 31.9 | 8.1 | 9.6 | 86.6 |
| CIR95CTD0175 | 46.00 | 6.6 | 31.9 | 8.1 | 9.5 | 86.6 |
| CIR95CTD0176 | 46.50 | 6.6 | 31.9 | 8.1 | 9.5 | 86.6 |
| CIR95CTD0177 | 47.00 | 6.6 | 31.9 | 8.1 | 9.5 | 86.6 |
| CIR95CTD0178 | 47.50 | 6.5 | 31.9 | 8.1 | 9.5 | 86.7 |
| CIR95CTD0179 | 48.00 | 6.5 | 32.0 | 8.1 | 9.6 | 86.7 |

# Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** NULLZ-H **SURVEY:** 1 CAST DATE: 6/20/95 CAST TIME (ADT):11:41

**STATION LOCATION** Latitude (N) 59° 4' 58.90" Longitude (W) 152° 48' 58.40"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0180 | 48.50 | 6.5 | 32.0 | 8.1 | 9.5 | 86.7 |
| CIR95CTD0181 | 49.00 | 6.5 | 32.0 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0182 | 49.50 | 6.6 | 32.0 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0183 | 50.00 | 6.6 | 32.0 | 8.1 | 9.5 | 86.7 |
| CIR95CTD0184 | 50.50 | 6.6 | 32.0 | 8.1 | 9.5 | 86.7 |
| CIR95CTD0185 | 51.00 | 6.6 | 32.0 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0186 | 51.50 | 6.6 | 32.0 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0187 | 52.00 | 6.6 | 32.0 | 8.1 | 9.5 | 86.7 |
| CIR95CTD0188 | 52.50 | 6.6 | 32.0 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0189 | 53.00 | 6.6 | 32.0 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0190 | 53.50 | 6.6 | 32.0 | 8.1 | 9.5 | 86.7 |
| CIR95CTD0191 | 54.00 | 6.6 | 32.0 | 8.1 | 9.5 | 86.7 |
| CIR95CTD0192 | 54.50 | 6.6 | 32.0 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0193 | 55.00 | 6.6 | 32.0 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0194 | 55.50 | 6.6 | 32.0 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0195 | 56.00 | 6.6 | 32.0 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0196 | 56.50 | 6.6 | 32.0 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0197 | 57.00 | 6.6 | 32.0 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0198 | 57.50 | 6.6 | 32.0 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0199 | 58.00 | 6.6 | 32.1 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0200 | 58.50 | 6.6 | 32.1 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0201 | 59.00 | 6.6 | 32.1 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0202 | 59.50 | 6.5 | 32.1 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0203 | 60.00 | 6.5 | 32.1 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0204 | 60.50 | 6.5 | 32.1 | 8.1 | 9.6 | 86.2 |
| CIR95CTD0205 | 61.00 | 6.5 | 32.1 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0206 | 61.50 | 6.5 | 32.1 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0207 | 62.00 | 6.5 | 32.1 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0208 | 62.50 | 6.5 | 32.1 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0209 | 63.00 | 6.5 | 32.1 | 8.1 | 9.6 | 86.8 |
| CIR95CTD0210 | 63.50 | 6.5 | 32.1 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0211 | 64.00 | 6.5 | 32.1 | 8.1 | 9.6 | 86.7 |
| CIR95CTD0212 | 64.50 | 6.5 | 32.1 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0213 | 65.00 | 6.4 | 32.1 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0214 | 65.50 | 6.4 | 32.1 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0215 | 66.00 | 6.4 | 32.1 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0216 | 66.50 | 6.4 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0217 | 67.00 | 6.4 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0218 | 67.50 | 6.4 | 32.2 | 8.1 | 9.5 | 86.6 |
| CIR95CTD0219 | 68.00 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0220 | 68.50 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0221 | 69.00 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0222 | 69.50 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0223 | 70.00 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0224 | 70.50 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0225 | 71.00 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0226 | 71.50 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0227 | 72.00 | 6.3 | 32.2 | 8.1 | 9.5 | 86.7 |

## Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** NULLZ-H **SURVEY:** 1 CAST DATE: 6/20/95 CAST TIME (ADT):11:41

**STATION LOCATION** Latitude (N) 59° 4' 58.90" Longitude (W) 152° 48' 58.40"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0228 | 72.50 | 6.3 | 32.2 | 8.1 | 9.5 | 86.6 |
| CIR95CTD0229 | 73.00 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0230 | 73.50 | 6.3 | 32.2 | 8.1 | 9.5 | 86.8 |
| CIR95CTD0231 | 74.00 | 6.3 | 32.2 | 8.1 | 9.5 | 86.7 |
| CIR95CTD0232 | 74.50 | 6.3 | 32.2 | 8.0 | 9.5 | 86.7 |
| CIR95CTD0233 | 75.00 | 6.3 | 32.2 | 8.0 | 9.5 | 86.7 |
| CIR95CTD0234 | 75.50 | 6.3 | 32.2 | 8.0 | 9.4 | 86.7 |
| CIR95CTD0235 | 76.00 | 6.3 | 32.2 | 8.0 | 9.4 | 86.7 |
| CIR95CTD0236 | 76.50 | 6.2 | 32.2 | 8.0 | 9.4 | 86.7 |
| CIR95CTD0237 | 77.00 | 6.2 | 32.2 | 8.0 | 9.4 | 86.7 |
| CIR95CTD0238 | 77.50 | 6.2 | 32.2 | 8.0 | 9.4 | 86.6 |
| CIR95CTD0239 | 78.00 | 6.2 | 32.2 | 8.0 | 9.4 | 86.6 |
| CIR95CTD0240 | 78.50 | 6.2 | 32.2 | 8.0 | 9.4 | 86.6 |
| CIR95CTD0241 | 79.00 | 6.2 | 32.2 | 8.0 | 9.4 | 86.6 |
| CIR95CTD0242 | 79.50 | 6.2 | 32.2 | 8.0 | 9.3 | 86.6 |
| CIR95CTD0243 | 80.00 | 6.1 | 32.2 | 8.0 | 9.3 | 86.5 |
| CIR95CTD0244 | 80.50 | 6.1 | 32.2 | 8.0 | 9.3 | 86.5 |
| CIR95CTD0245 | 81.00 | 6.1 | 32.2 | 8.0 | 9.3 | 86.5 |
| CIR95CTD0246 | 81.50 | 6.1 | 32.2 | 8.0 | 9.3 | 86.5 |
| CIR95CTD0247 | 82.00 | 6.1 | 32.2 | 8.0 | 9.3 | 86.4 |
| CIR95CTD0248 | 82.50 | 6.1 | 32.2 | 8.0 | 9.2 | 86.2 |
| CIR95CTD0249 | 83.00 | 6.1 | 32.2 | 8.0 | 9.2 | 86.3 |
| CIR95CTD0250 | 83.50 | 6.1 | 32.2 | 8.0 | 9.2 | 86.4 |
| CIR95CTD0251 | 84.00 | 6.1 | 32.2 | 8.0 | 9.3 | 86.4 |
| CIR95CTD0252 | 84.50 | 6.1 | 32.2 | 8.0 | 9.3 | 86.3 |
| CIR95CTD0253 | 85.00 | 6.1 | 32.2 | 8.0 | 9.3 | 86.2 |
| CIR95CTD0254 | 85.50 | 6.1 | 32.2 | 8.0 | 9.2 | 86.2 |
| CIR95CTD0255 | 86.00 | 6.1 | 32.2 | 8.0 | 9.3 | 86.2 |
| CIR95CTD0256 | 86.50 | 6.1 | 32.2 | 8.0 | 9.2 | 86.1 |
| CIR95CTD0257 | 87.00 | 6.1 | 32.2 | 8.0 | 9.3 | 86.1 |
| CIR95CTD0258 | 87.50 | 6.1 | 32.2 | 8.0 | 9.2 | 86.2 |
| CIR95CTD0259 | 88.00 | 6.0 | 32.2 | 8.0 | 9.2 | 86.2 |
| CIR95CTD0260 | 88.50 | 6.1 | 32.2 | 8.0 | 9.2 | 86.2 |
| CIR95CTD0261 | 89.00 | 6.0 | 32.2 | 8.0 | 9.2 | 86.1 |
| CIR95CTD0262 | 89.50 | 6.0 | 32.2 | 8.0 | 9.2 | 86.2 |
| CIR95CTD0263 | 90.00 | 6.0 | 32.2 | 8.0 | 9.2 | 85.8 |
| CIR95CTD0264 | 90.50 | 6.0 | 32.2 | 8.0 | 9.2 | 86.2 |
| CIR95CTD0265 | 91.00 | 6.0 | 32.2 | 8.0 | 9.3 | 86.1 |
| CIR95CTD0266 | 91.50 | 6.0 | 32.2 | 8.0 | 9.3 | 86.1 |
| CIR95CTD0267 | 92.00 | 6.0 | 32.2 | 8.0 | 9.2 | 86.1 |
| CIR95CTD0268 | 92.50 | 6.0 | 32.2 | 8.0 | 9.3 | 86.1 |
| CIR95CTD0269 | 93.00 | 6.0 | 32.2 | 8.0 | 9.3 | 86.1 |
| CIR95CTD0270 | 93.50 | 6.0 | 32.2 | 8.0 | 9.2 | 86.1 |
| CIR95CTD0271 | 94.00 | 6.0 | 32.2 | 8.0 | 9.2 | 86.1 |
| CIR95CTD0272 | 94.50 | 6.0 | 32.2 | 8.0 | 9.2 | 86.1 |
| CIR95CTD0273 | 95.00 | 6.0 | 32.2 | 8.0 | 9.2 | 85.9 |
| CIR95CTD0274 | 95.50 | 6.0 | 32.2 | 8.0 | 9.2 | 86.1 |
| CIR95CTD0275 | 96.00 | 6.0 | 32.2 | 8.0 | 9.2 | 86.0 |

# Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** NULLZ-H **SURVEY:** 1 CAST DATE: 6/20/95 CAST TIME (ADT):11:41

**STATION LOCATION** Latitude (N) 59° 4' 58.90" Longitude (W) 152° 48' 58.40"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0276 | 96.50 | 6.0 | 32.2 | 8.0 | 9.2 | 86.1 |
| CIR95CTD0277 | 97.00 | 6.0 | 32.2 | 8.0 | 9.2 | 85.9 |
| CIR95CTD0278 | 97.50 | 6.0 | 32.2 | 8.0 | 9.2 | 86.1 |
| CIR95CTD0279 | 98.00 | 6.0 | 32.2 | 8.0 | 9.3 | 86.0 |
| CIR95CTD0280 | 98.50 | 6.0 | 32.2 | 8.0 | 9.2 | 86.0 |
| CIR95CTD0281 | 99.00 | 6.0 | 32.2 | 8.0 | 9.2 | 86.0 |
| CIR95CTD0282 | 99.50 | 6.0 | 32.2 | 8.0 | 9.2 | 85.8 |
| CIR95CTD0283 | 100.00 | 6.0 | 32.2 | 8.0 | 9.2 | 85.9 |
| CIR95CTD0284 | 100.50 | 6.0 | 32.2 | 8.0 | 9.2 | 85.9 |
| CIR95CTD0285 | 101.00 | 6.0 | 32.2 | 8.0 | 9.2 | 85.8 |
| CIR95CTD0286 | 101.50 | 6.0 | 32.2 | 8.0 | 9.2 | 85.7 |
| CIR95CTD0287 | 102.00 | 6.0 | 32.2 | 8.0 | 9.2 | 85.8 |
| CIR95CTD0288 | 102.50 | 6.0 | 32.2 | 8.0 | 9.2 | 85.7 |
| CIR95CTD0289 | 103.00 | 6.0 | 32.2 | 8.0 | 9.2 | 85.6 |
| CIR95CTD0290 | 103.50 | 6.0 | 32.2 | 8.0 | 9.2 | 85.6 |
| CIR95CTD0291 | 104.00 | 6.0 | 32.2 | 8.0 | 9.2 | 85.6 |
| CIR95CTD0292 | 104.50 | 6.0 | 32.2 | 8.0 | 9.2 | 85.7 |
| CIR95CTD0293 | 105.00 | 6.0 | 32.2 | 8.0 | 9.2 | 85.6 |
| CIR95CTD0294 | 105.50 | 6.0 | 32.2 | 8.0 | 9.2 | 85.4 |
| CIR95CTD0295 | 106.00 | 6.0 | 32.2 | 8.0 | 9.2 | 85.4 |
| CIR95CTD0296 | 106.50 | 6.0 | 32.2 | 8.0 | 9.1 | 85.3 |
| CIR95CTD0297 | 107.00 | 6.0 | 32.2 | 8.0 | 9.1 | 85.3 |
| CIR95CTD0298 | 107.50 | 6.0 | 32.2 | 8.0 | 9.2 | 85.3 |
| CIR95CTD0299 | 108.00 | 6.0 | 32.2 | 8.0 | 9.1 | 84.9 |
| CIR95CTD0300 | 108.50 | 6.0 | 32.2 | 8.0 | 9.2 | 85.2 |
| CIR95CTD0301 | 109.00 | 6.0 | 32.2 | 8.0 | 9.2 | 84.9 |
| CIR95CTD0302 | 109.50 | 6.0 | 32.2 | 8.0 | 9.2 | 84.8 |
| CIR95CTD0303 | 110.00 | 6.0 | 32.2 | 8.0 | 9.2 | 84.6 |
| CIR95CTD0304 | 110.50 | 6.0 | 32.2 | 8.0 | 9.1 | 84.6 |
| CIR95CTD0305 | 111.00 | 6.0 | 32.2 | 8.0 | 9.2 | 84.5 |
| CIR95CTD0306 | 111.50 | 6.0 | 32.2 | 8.0 | 9.2 | 84.5 |
| CIR95CTD0307 | 112.00 | 6.0 | 32.2 | 8.0 | 9.2 | 84.5 |
| CIR95CTD0308 | 112.50 | 6.0 | 32.2 | 8.0 | 9.2 | 84.6 |
| CIR95CTD0309 | 113.00 | 6.0 | 32.2 | 8.0 | 9.2 | 84.6 |
| CIR95CTD0310 | 113.50 | 6.0 | 32.2 | 8.0 | 9.1 | 84.6 |
| CIR95CTD0311 | 114.00 | 5.9 | 32.2 | 8.0 | 9.1 | 84.6 |
| CIR95CTD0312 | 114.50 | 6.0 | 32.2 | 8.0 | 9.2 | 84.5 |
| CIR95CTD0313 | 115.00 | 6.0 | 32.2 | 8.0 | 9.2 | 84.6 |
| CIR95CTD0314 | 115.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.5 |
| CIR95CTD0315 | 116.00 | 6.0 | 32.2 | 8.0 | 9.2 | 84.5 |
| CIR95CTD0316 | 116.50 | 5.9 | 32.2 | 8.0 | 9.1 | 84.4 |
| CIR95CTD0317 | 117.00 | 5.9 | 32.2 | 8.0 | 9.1 | 84.5 |
| CIR95CTD0318 | 117.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.3 |
| CIR95CTD0319 | 118.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.5 |
| CIR95CTD0320 | 118.50 | 5.9 | 32.2 | 8.0 | 9.1 | 84.4 |
| CIR95CTD0321 | 119.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.4 |
| CIR95CTD0322 | 119.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.5 |
| CIR95CTD0323 | 120.00 | 5.9 | 32.2 | 8.0 | 9.1 | 83.6 |

# Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** NULLZ-H **SURVEY:** 1 CAST DATE: 6/20/95 CAST TIME (ADT):11:41

**STATION LOCATION** Latitude (N) 59° 4' 58.90" Longitude (W) 152° 48' 58.40"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0324 | 120.50 | 5.9 | 32.3 | 8.0 | 9.2 | 77.3 |
| CIR95CTD0325 | 121.00 | 5.9 | 32.2 | 8.0 | 9.2 | 78.8 |
| CIR95CTD0326 | 121.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.2 |
| CIR95CTD0327 | 122.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.1 |
| CIR95CTD0328 | 122.50 | 5.9 | 32.2 | 8.0 | 9.1 | 84.2 |
| CIR95CTD0329 | 123.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.2 |
| CIR95CTD0330 | 123.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.2 |
| CIR95CTD0331 | 124.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.3 |
| CIR95CTD0332 | 124.50 | 5.9 | 32.2 | 8.0 | 9.1 | 84.3 |
| CIR95CTD0333 | 125.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.2 |
| CIR95CTD0334 | 125.50 | 5.9 | 32.2 | 8.0 | 9.1 | 84.3 |
| CIR95CTD0335 | 126.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.2 |
| CIR95CTD0336 | 126.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.2 |
| CIR95CTD0337 | 127.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.3 |
| CIR95CTD0338 | 127.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.2 |
| CIR95CTD0339 | 128.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.3 |
| CIR95CTD0340 | 128.50 | 5.9 | 32.2 | 8.0 | 9.1 | 84.2 |
| CIR95CTD0341 | 129.00 | 5.9 | 32.2 | 8.0 | 9.1 | 84.1 |
| CIR95CTD0342 | 129.50 | 5.9 | 32.2 | 8.0 | 9.2 | 83.5 |
| CIR95CTD0343 | 130.00 | 5.9 | 32.2 | 8.0 | 9.1 | 84.2 |
| CIR95CTD0344 | 130.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.1 |
| CIR95CTD0345 | 131.00 | 5.9 | 32.2 | 8.0 | 9.1 | 83.6 |
| CIR95CTD0346 | 131.50 | 5.9 | 32.2 | 8.0 | 9.2 | 83.4 |
| CIR95CTD0347 | 132.00 | 5.9 | 32.2 | 8.0 | 9.2 | 83.5 |
| CIR95CTD0348 | 132.50 | 5.9 | 32.2 | 8.0 | 9.2 | 83.0 |
| CIR95CTD0349 | 133.00 | 5.9 | 32.2 | 8.0 | 9.2 | 83.8 |
| CIR95CTD0350 | 133.50 | 5.9 | 32.2 | 8.0 | 9.2 | 83.8 |
| CIR95CTD0351 | 134.00 | 5.9 | 32.2 | 8.0 | 9.2 | 83.7 |
| CIR95CTD0352 | 134.50 | 5.9 | 32.3 | 8.0 | 9.2 | 83.7 |
| CIR95CTD0353 | 135.00 | 5.9 | 32.2 | 8.0 | 9.2 | 83.7 |
| CIR95CTD0354 | 135.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.0 |
| CIR95CTD0355 | 136.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.1 |
| CIR95CTD0356 | 136.50 | 5.9 | 32.2 | 8.0 | 9.1 | 84.1 |
| CIR95CTD0357 | 137.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.1 |
| CIR95CTD0358 | 137.50 | 5.9 | 32.2 | 8.0 | 9.1 | 84.2 |
| CIR95CTD0359 | 138.00 | 5.9 | 32.2 | 8.0 | 9.1 | 84.1 |
| CIR95CTD0360 | 138.50 | 5.9 | 32.2 | 8.0 | 9.1 | 84.1 |
| CIR95CTD0361 | 139.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.1 |
| CIR95CTD0362 | 139.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.1 |
| CIR95CTD0363 | 140.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.1 |
| CIR95CTD0364 | 140.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.1 |
| CIR95CTD0365 | 141.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.1 |
| CIR95CTD0366 | 141.50 | 5.9 | 32.2 | 8.0 | 9.2 | 84.1 |
| CIR95CTD0367 | 142.00 | 5.9 | 32.2 | 8.0 | 9.2 | 84.0 |
| CIR95CTD0368 | 142.50 | 5.9 | 32.2 | 8.0 | 9.2 | 83.9 |
| CIR95CTD0369 | 143.00 | 5.9 | 32.2 | 8.0 | 9.2 | 83.9 |
| CIR95CTD0370 | 143.50 | 5.9 | 32.2 | 8.0 | 9.2 | 83.9 |

# Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** SEKAM-H **SURVEY:** 1 CAST DATE: 6/20/95 CAST TIME (ADT):17:41

**STATION LOCATION** Latitude (N) 59° 4' 52.60" Longitude (W) 153° 36' 53.30"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0371 | 1.50 | 8.5 | 29.0 | 8.1 | 10.3 | 63.0 |
| CIR95CTD0372 | 2.00 | 8.5 | 29.0 | 8.1 | 10.3 | 63.1 |
| CIR95CTD0373 | 2.50 | 8.5 | 29.0 | 8.1 | 10.3 | 63.2 |
| CIR95CTD0374 | 3.00 | 8.5 | 29.0 | 8.1 | 10.3 | 63.4 |
| CIR95CTD0375 | 3.50 | 8.5 | 29.0 | 8.1 | 10.3 | 63.5 |
| CIR95CTD0376 | 4.00 | 8.4 | 29.0 | 8.1 | 10.3 | 64.2 |
| CIR95CTD0377 | 4.50 | 8.3 | 29.1 | 8.1 | 10.3 | 64.3 |
| CIR95CTD0378 | 5.00 | 8.3 | 29.4 | 8.1 | 10.3 | 66.2 |
| CIR95CTD0379 | 5.50 | 8.2 | 29.5 | 8.1 | 10.3 | 65.8 |
| CIR95CTD0380 | 6.00 | 8.2 | 29.4 | 8.1 | 10.3 | 66.2 |
| CIR95CTD0381 | 6.50 | 8.2 | 29.5 | 8.1 | 10.1 | 66.4 |
| CIR95CTD0382 | 7.00 | 8.2 | 29.5 | 8.1 | 10.0 | 66.6 |
| CIR95CTD0383 | 7.50 | 8.2 | 29.6 | 8.1 | 10.1 | 67.0 |
| CIR95CTD0384 | 8.00 | 8.1 | 29.7 | 8.1 | 10.1 | 67.8 |
| CIR95CTD0385 | 8.50 | 8.1 | 29.8 | 8.1 | 10.0 | 67.7 |
| CIR95CTD0386 | 9.00 | 8.1 | 29.8 | 8.1 | 10.1 | 68.2 |
| CIR95CTD0387 | 9.50 | 8.0 | 29.9 | 8.1 | 10.0 | 69.1 |
| CIR95CTD0388 | 10.00 | 7.9 | 29.9 | 8.1 | 10.0 | 69.4 |
| CIR95CTD0389 | 10.50 | 7.9 | 29.9 | 8.1 | 10.0 | 69.5 |
| CIR95CTD0390 | 11.00 | 7.9 | 30.0 | 8.1 | 9.9 | 69.5 |
| CIR95CTD0391 | 11.50 | 7.8 | 30.0 | 8.1 | 9.9 | 69.3 |
| CIR95CTD0392 | 12.00 | 7.8 | 30.1 | 8.1 | 10.1 | 69.6 |
| CIR95CTD0393 | 12.50 | 7.7 | 30.1 | 8.1 | 10.0 | 69.7 |
| CIR95CTD0394 | 13.00 | 7.7 | 30.1 | 8.1 | 9.9 | 69.5 |
| CIR95CTD0395 | 13.50 | 7.7 | 30.1 | 8.1 | 9.9 | 69.6 |
| CIR95CTD0396 | 14.00 | 7.7 | 30.2 | 8.1 | 9.9 | 69.5 |
| CIR95CTD0397 | 14.50 | 7.7 | 30.2 | 8.1 | 9.8 | 68.1 |

# Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** TRADB-H **SURVEY:** 1 CAST DATE: 6/23/95 CAST TIME (ADT):19:28

**STATION LOCATION** Latitude (N) 60° 51' 38.10" Longitude (W) 151° 41' 36.30"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0398 | 1.50 | 9.7 | 21.0 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0399 | 2.00 | 9.5 | 22.7 | 8.0 | 9.9 | 0.0 |
| CIR95CTD0400 | 2.50 | 9.3 | 23.1 | 7.9 | 10.0 | 0.0 |
| CIR95CTD0401 | 3.00 | 9.2 | 23.4 | 7.9 | 10.0 | 0.0 |
| CIR95CTD0402 | 3.50 | 9.2 | 23.5 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0403 | 4.00 | 9.2 | 23.6 | 7.9 | 10.0 | 0.0 |
| CIR95CTD0404 | 4.50 | 9.2 | 23.7 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0405 | 5.00 | 9.1 | 23.8 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0406 | 5.50 | 9.1 | 23.8 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0407 | 6.00 | 9.1 | 23.9 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0408 | 6.50 | 9.1 | 24.0 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0409 | 7.00 | 9.1 | 24.0 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0410 | 7.50 | 9.1 | 24.1 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0411 | 8.00 | 9.0 | 24.1 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0412 | 8.50 | 9.0 | 24.1 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0413 | 9.00 | 9.0 | 24.1 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0414 | 9.50 | 9.0 | 24.2 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0415 | 10.00 | 9.0 | 24.2 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0416 | 10.50 | 9.0 | 24.4 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0417 | 11.00 | 9.0 | 24.5 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0418 | 11.50 | 9.0 | 24.5 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0419 | 12.00 | 9.0 | 24.5 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0420 | 12.50 | 9.0 | 24.5 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0421 | 13.00 | 9.0 | 24.5 | 8.0 | 10.0 | 0.0 |
| CIR95CTD0422 | 13.50 | 9.0 | 24.5 | 8.0 | 10.0 | 0.0 |

## Hydrographic Profile Data for Cook Inlet 1995 EMP

**STATION ID:** TRADB-H **SURVEY:** 2 CAST DATE: 7/26/95 CAST TIME (ADT):10:49

**STATION LOCATION** Latitude (N) 60° 48' 25.10" Longitude (W) 151° 42' 33.80"

| Sample ID | Depth (Meters) | Temperature (°C) | Salinity (ppt) | Ph (units) | Dissolved Oxygen (mg/L) | Transmissivity (%) |
|---|---|---|---|---|---|---|
| CIR95CTD0506 | 0.50 | 12.4 | 20.2 | 8.0 | 9.4 | 0.0 |
| CIR95CTD0507 | 1.00 | 12.4 | 20.3 | 8.0 | 9.4 | 0.0 |
| CIR95CTD0508 | 1.50 | 12.4 | 20.8 | 8.0 | 9.3 | 0.0 |
| CIR95CTD0509 | 2.00 | 12.3 | 20.9 | 8.0 | 9.4 | 0.0 |
| CIR95CTD0510 | 2.50 | 12.3 | 21.0 | 7.9 | 9.3 | 0.0 |
| CIR95CTD0511 | 3.00 | 12.3 | 21.0 | 7.9 | 9.4 | 0.0 |
| CIR95CTD0512 | 3.50 | 12.3 | 21.1 | 7.9 | 9.3 | 0.0 |
| CIR95CTD0513 | 4.00 | 12.3 | 21.1 | 7.9 | 9.3 | 0.0 |
| CIR95CTD0514 | 4.50 | 12.3 | 21.2 | 7.9 | 9.4 | 0.0 |
| CIR95CTD0515 | 5.00 | 12.3 | 21.2 | 7.9 | 9.4 | 0.0 |
| CIR95CTD0516 | 5.50 | 12.3 | 21.2 | 7.9 | 9.3 | 0.0 |
| CIR95CTD0517 | 6.00 | 12.3 | 21.2 | 7.9 | 9.3 | 0.0 |

## CIRCAC 1995 EMP CTD QC DATA

| samp_id | stn_id | survey_no | rep_lat_dg | rep_lat_mn | rep_lat_sc | rep_lon_dg | rep_lon_mn | rep_lon_sc | coll_date | coll_time | depth (m) | anal_ty | analyte | value | value_un |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CIR95DOX0001 | KACHB-H | 1 | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -1.50 | DOX | DISSOLVED OXYGEN | 10.89 | MG/L |
| CIR95DOX0002 | KACHB-H | 1 | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -1.50 | DOX | DISSOLVED OXYGEN | 10.81 | MG/L |
| CIR95DOX0003 | TRADB-H | 1 | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -1.50 | DOX | DISSOLVED OXYGEN | 10.39 | MG/L |
| CIR95DOX0004 | TRADB-H | 1 | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -1.50 | DOX | DISSOLVED OXYGEN | 10.48 | MG/L |
| CIR95DOX0005 | KAMIB-H | 2 | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -1.00 | DOX | DISSOLVED OXYGEN | 8.81 | MG/L |
| CIR95DOX0006 | KAMIB-H | 2 | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -1.00 | DOX | DISSOLVED OXYGEN | 9.15 | MG/L |
| CIR95NTU0001 | KACHB-H | 1 | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -1.50 | NTU | NTU | 1.00 | NTU |
| CIR95NTU0002 | TRADB-H | 1 | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -1.50 | NTU | NTU | 29.9 | NTU |
| CIR95SAL0001 | KACHB-H | 1 | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:48 | -1.5 | SAL | SALINITY | 29.715 | PPT |
| CIR95SAL0002 | KACHB-H | 1 | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:48 | -1.5 | SAL | SALINITY | 29.667 | PPT |
| CIR95SAL0003 | TRADB-H | 1 | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -0.5 | SAL | SALINITY | 15.214 | PPT |
| CIR95SAL0004 | TRADB-H | 1 | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -0.5 | SAL | SALINITY | 15.216 | PPT |
| CIR95SAL0005 | KAMIB-H | 2 | 59 | 22 | 33.6 | 153 | 46 | 13.9 | 7/29/95 | 17:09 | -1 | SAL | SALINITY | 29.95 | PPT |
| CIR95SAL0006 | KAMIB-H | 2 | 59 | 22 | 33.6 | 153 | 46 | 13.9 | 7/29/95 | 17:09 | -1 | SAL | SALINITY | 29.97 | PPT |
| CIR95TMP0001 | KACHB-H | 1 | 59 | 37 | 56.7 | 151 | 23 | 47.4 | 6/22/95 | 8:47 | -1.50 | TMP | TEMPERATURE | 9.8 | CELSIUS |
| CIR95TMP0002 | TRADB-H | 1 | 60 | 51 | 38.1 | 151 | 41 | 36.3 | 6/23/95 | 19:28 | -1.50 | TMP | TEMPERATURE | 8.6 | CELSIUS |
| CIR95TMP0003 | KAMIB-H | 2 | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -1.00 | TMP | TEMPERATURE | 11.8 | CELSIUS |
| CIR95TMP0004 | KAMIB-H | 2 | 59 | 22 | 34.6 | 153 | 46 | 15.4 | 7/29/95 | 17:04 | -1.00 | TMP | TEMPERATURE | 11.8 | CELSIUS |

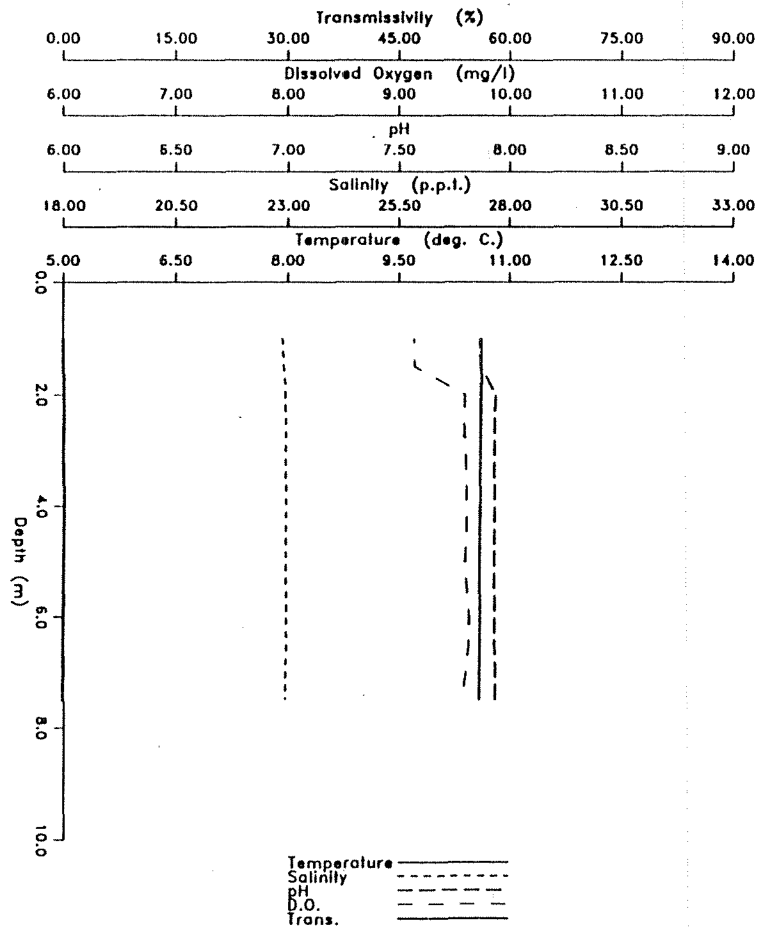
# APPENDIX E

## Hydrographic Results

## 2.0 CTD Profiles

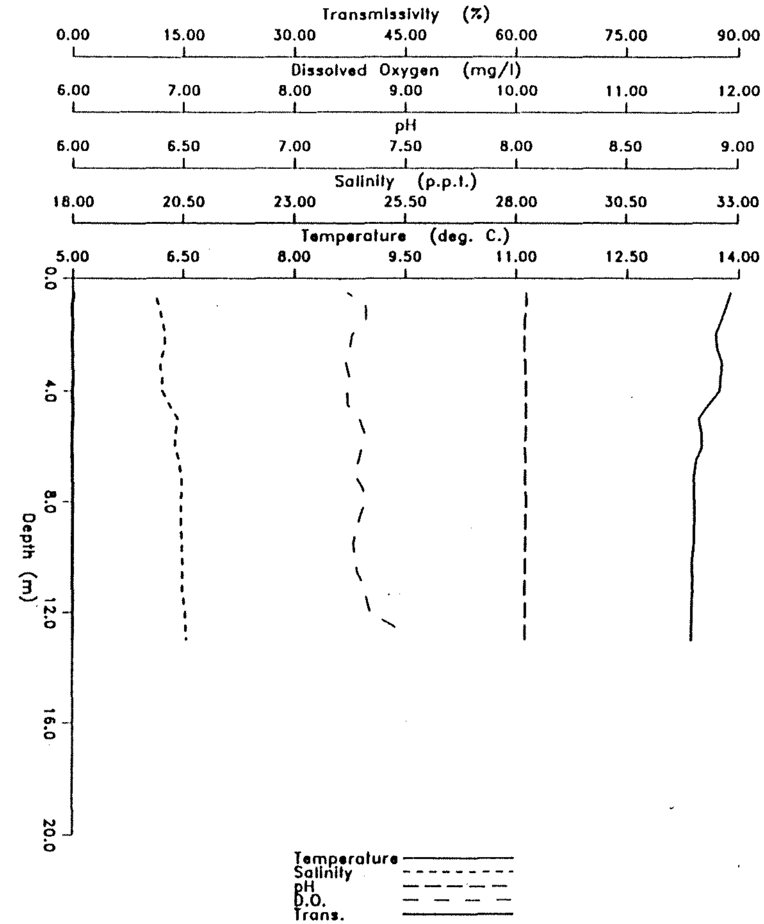
## HYDROGRAPHIC PROFILE (SURVEY 1)

Station: EFORE-H Date: 6/23/95 Time: 11:13



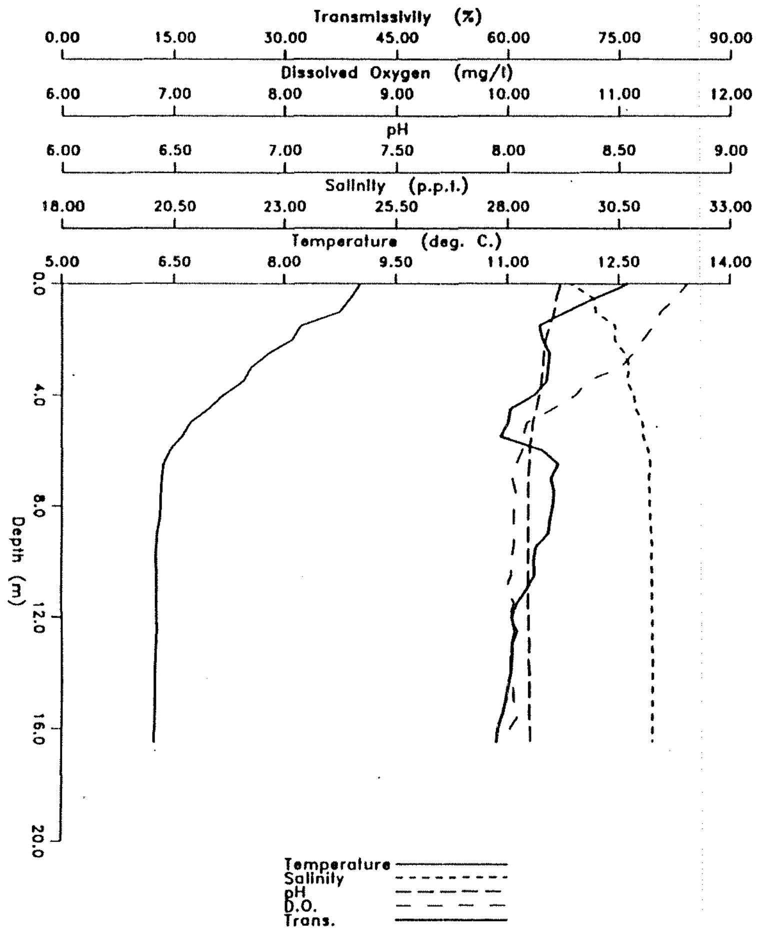

## HYDROGRAPHIC PROFILE (SURVEY 2)

Station: EFORE-H Date: 7/25/95 Time: 21:34



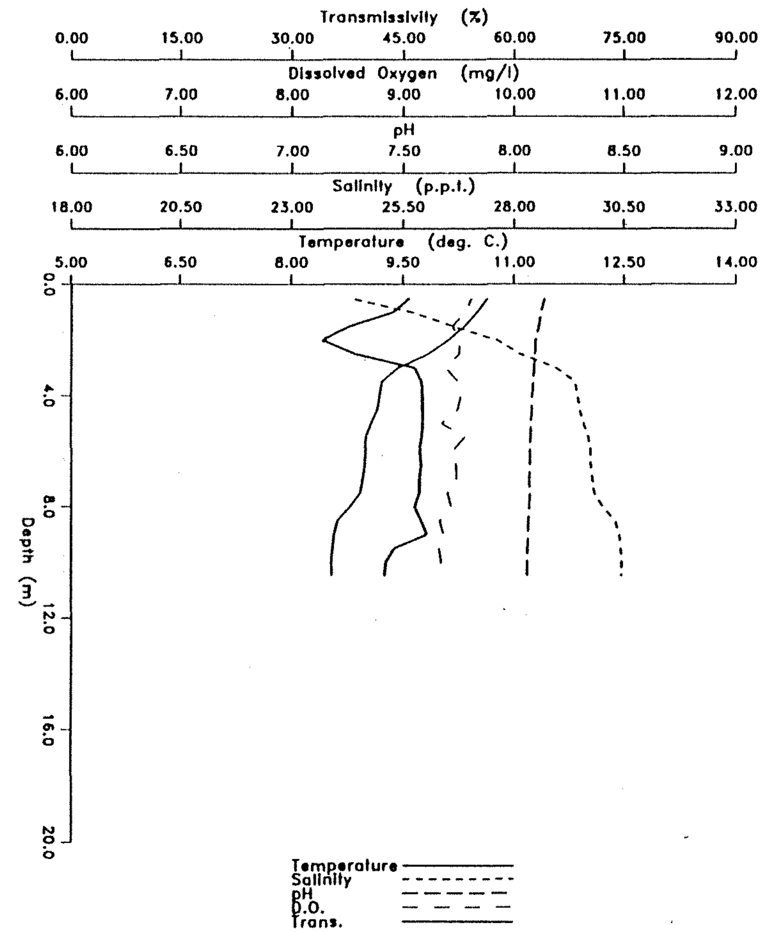
# HYDROGRAPHIC PROFILE (SURVEY 1)

Station: KACHB-H Date: 6/22/95 Time: 08:47



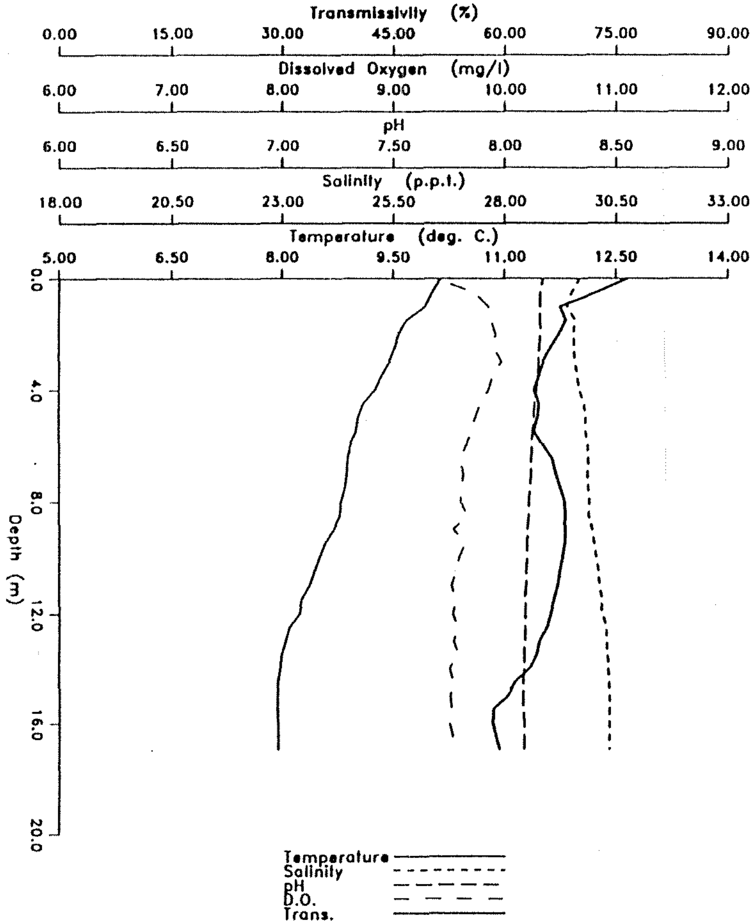

# HYDROGRAPHIC PROFILE (SURVEY 2)

Station: KACHB-H Date: 7/27/95 Time: 10:13



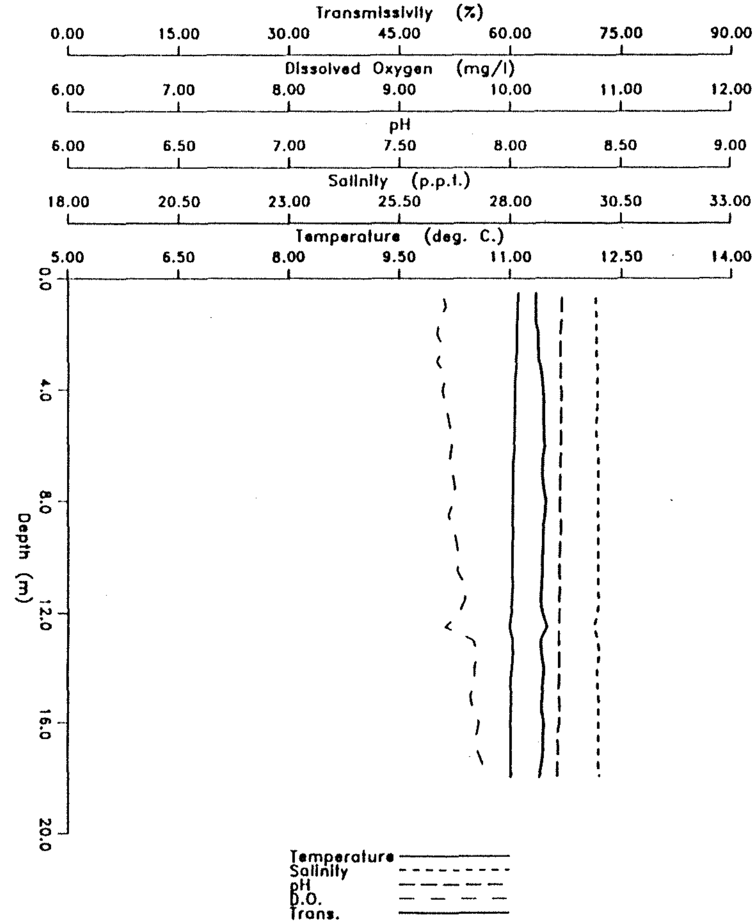
## HYDROGRAPHIC PROFILE (SURVEY 1)

Station: KAMIB-H Date: 6/21/95 Time: 11:11



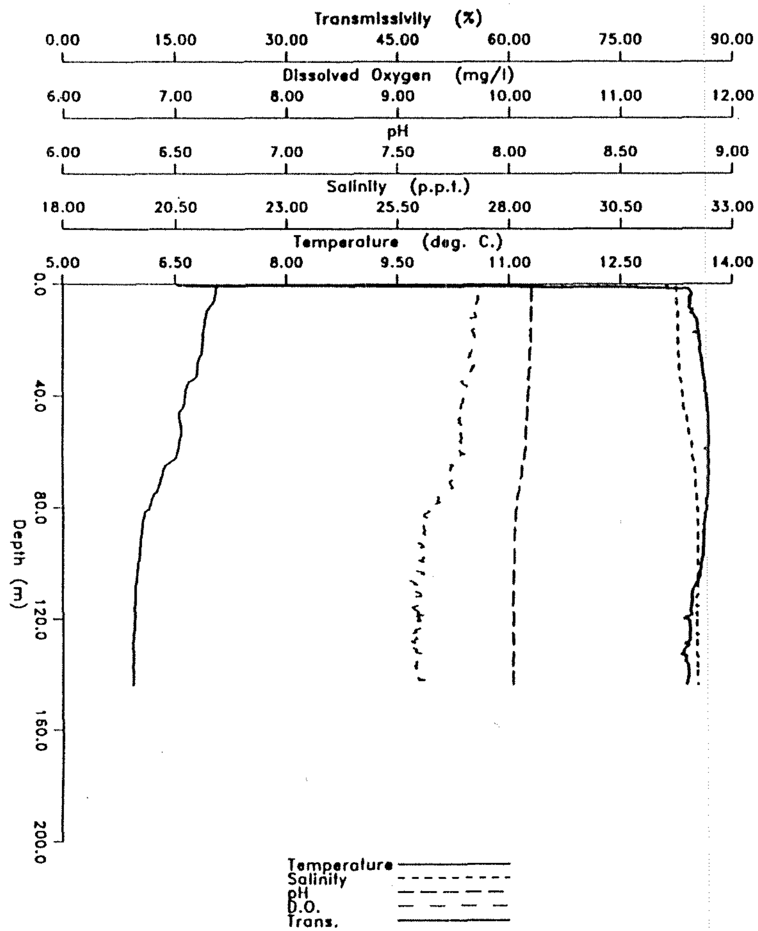

## HYDROGRAPHIC PROFILE (SURVEY 2)

Station: KAMIB-H Date: 7/29/95 Time: 17:04



## HYDROGRAPHIC DATA (SURVEY 1)

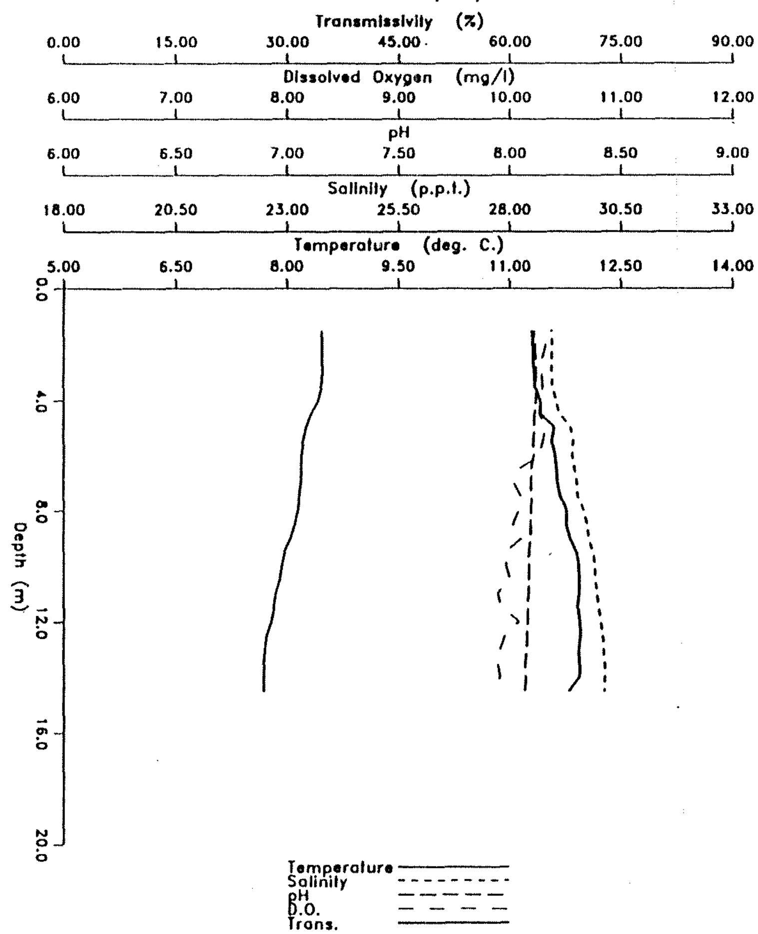
Station: NULLZ-H Date: 6/20/95 Time: 11:41




NO CAST DURING SURVEY 2

## HYDROGRAPHIC PROFILE (SURVEY 1)

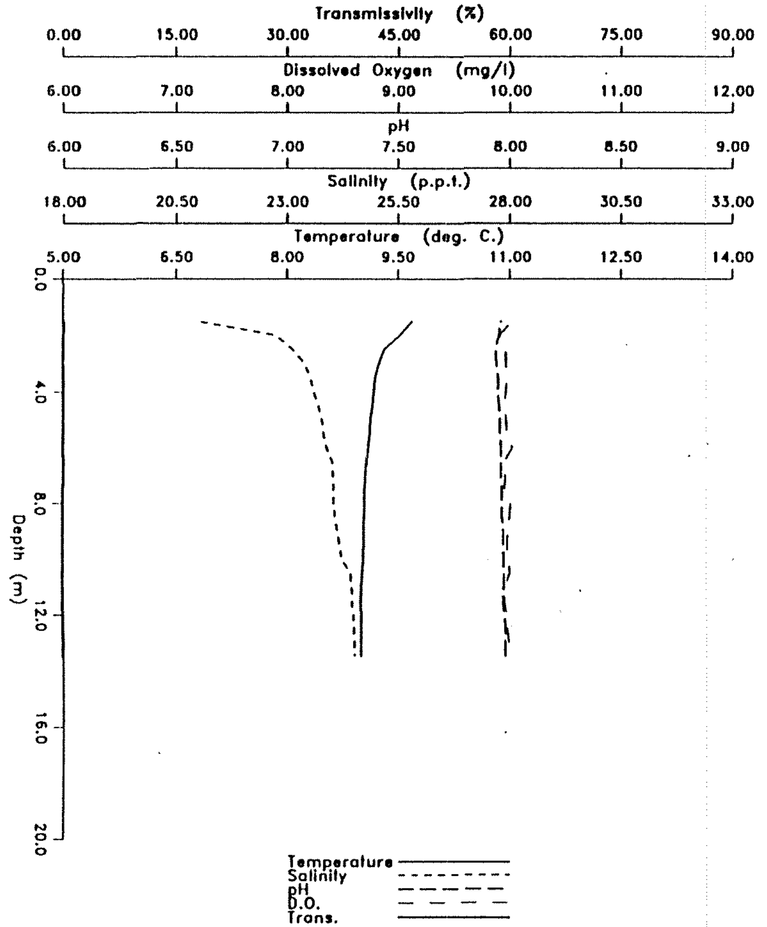
Station: SEKAM-H Date: 6/20/95 Time: 17:41




NO CAST DURING SURVEY 2

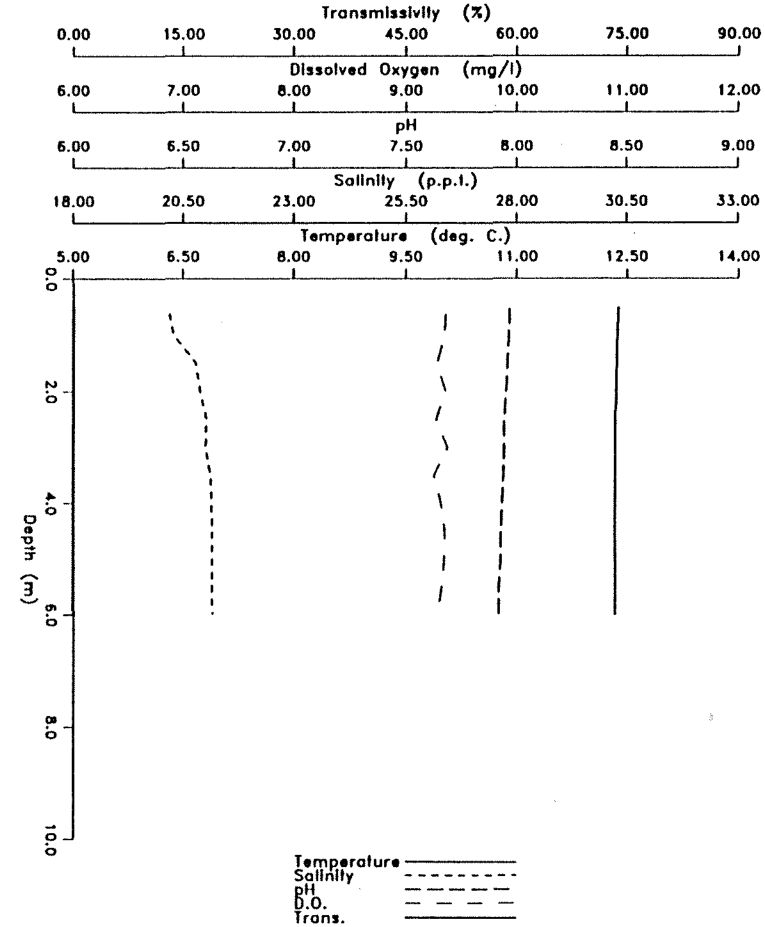
## HYDROGRAPHIC PROFILE (SURVEY 1)

Station: TRADB-H Date: 6/23/95 Time: 19:28




## HYDROGRAPHIC PROFILE (SURVEY 2)

Station: TRADB-H Date: 7/26/95 Time: 10:49



# APPENDIX F

## Bivalve Condition Index Results

## 1.0 BCI Data

# Bivalve Condition Index Data for Cook Inlet 1995 EMP

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0035 | *Macoma spp.* | 0.27 | 0.05 | 18.52 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0036 | *Clinocardium ciliatum* | 0.25 | 0.04 | 16.00 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0037 | *Nuculana radiata* | 0.08 | 0.01 | 12.50 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0038 | *Nuculana radiata* | 0.06 | 0.02 | 33.33 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0039 | *Nuculana radiata* | 0.12 | 0.02 | 16.67 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0040 | *Nuculana radiata* | 0.10 | 0.02 | 20.00 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0041 | *Nuculana radiata* | 0.12 | 0.02 | 16.67 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0042 | *Macoma spp.* | 0.63 | 0.18 | 28.57 |

## Bivalve Condition Index Data for Cook Inlet 1995 EMP

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0044 | *Macoma spp.* | 0.21 | 0.03 | 14.29 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0045 | *Nuculana radiata* | 0.08 | 0.02 | 25.00 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 3

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0049 | *Nuculana radiata* | 0.14 | 0.02 | 14.29 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 3

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0050 | *Nuculana radiata* | 0.11 | 0.02 | 18.18 |

**STATION ID:** KACHB-S **SURVEY:** 1 **REP #:** 3

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0051 | *Nuculana radiata* | 0.08 | 0.01 | 12.50 |

# Bivalve Condition Index Data for Cook Inlet 1995 EMP

STATION ID: KAMIB-S SURVEY: 1 REP #: 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0007 | *Macoma spp.* | 0.71 | 0.12 | 16.90 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0008 | *Portlandia intermedia* | 0.15 | 0.03 | 20.00 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0009 | *Portlandia intermedia* | 0.34 | 0.08 | 23.53 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0011 | *Portlandia intermedia* | 0.28 | 0.05 | 17.86 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0012 | *Portlandia intermedia* | 0.25 | 0.05 | 20.00 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0013 | *Macoma spp.* | 0.50 | 0.07 | 14.00 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0014 | *Macoma spp.* | 0.48 | 0.06 | 12.50 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0015 | *Portlandia intermedia* | 0.36 | 0.09 | 25.00 |

## Bivalve Condition Index Data for Cook Inlet 1995 EMP

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0016 | *Macoma spp.* | 1.16 | 0.16 | 13.79 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0017 | *Portlandia intermedia* | 0.39 | 0.08 | 20.51 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0018 | *Astarte alaskensis* | 0.28 | 0.02 | 7.14 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0020 | *Macoma spp.* | 2.91 | 0.20 | 6.87 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0021 | *Macoma spp.* | 1.67 | 0.16 | 9.58 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0022 | *Macoma spp.* | 0.97 | 0.14 | 14.43 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0023 | *Macoma spp.* | 0.93 | 0.17 | 18.28 |

STATION ID: KAMIB-S SURVEY: 1 REP #: 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0024 | *Macoma spp.* | 1.55 | 0.13 | 8.39 |

## Bivalve Condition Index Data for Cook Inlet 1995 EMP

| STATION ID: | KAMIB-S | SURVEY: | 1 | REP #: | 2 |
|---|---|---|---|---|---|

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0025 | *Macoma spp.* | 1.50 | 0.28 | 18.67 |

| STATION ID: | KAMIB-S | SURVEY: | 1 | REP #: | 3 |
|---|---|---|---|---|---|

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0026 | *Macoma spp.* | 2.26 | 0.28 | 12.39 |

| STATION ID: | KAMIB-S | SURVEY: | 1 | REP #: | 3 |
|---|---|---|---|---|---|

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0027 | *Macoma spp.* | 2.14 | 0.31 | 14.49 |

| STATION ID: | KAMIB-S | SURVEY: | 1 | REP #: | 3 |
|---|---|---|---|---|---|

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0029 | *Astarte montagui* | 0.68 | 0.07 | 10.29 |

| STATION ID: | KAMIB-S | SURVEY: | 1 | REP #: | 3 |
|---|---|---|---|---|---|

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0030 | *Macoma spp.* | 1.79 | 0.24 | 13.41 |

| STATION ID: | KAMIB-S | SURVEY: | 1 | REP #: | 3 |
|---|---|---|---|---|---|

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0031 | *Macoma spp.* | 0.44 | 0.05 | 11.36 |

| STATION ID: | KAMIB-S | SURVEY: | 1 | REP #: | 3 |
|---|---|---|---|---|---|

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0032 | *Macoma spp.* | 2.41 | 0.17 | 7.05 |

| STATION ID: | KAMIB-S | SURVEY: | 1 | REP #: | 3 |
|---|---|---|---|---|---|

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0033 | *Clinocardium ciliatum* | 2.48 | 0.24 | 9.68 |

## Bivalve Condition Index Data for Cook Inlet 1995 EMP

**STATION ID:** NULLZ-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0001 | *Astarte montagui* | 0.30 | 0.05 | 16.67 |

**STATION ID:** NULLZ-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0002 | *Astarte alaskensis* | 0.25 | 0.03 | 12.00 |

**STATION ID:** NULLZ-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0003 | *Astarte montagui* | 0.14 | 0.03 | 21.43 |

**STATION ID:** NULLZ-S **SURVEY:** 1 **REP #:** 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0004 | *Astarte alaskensis* | 0.39 | 0.06 | 15.38 |

**STATION ID:** NULLZ-S **SURVEY:** 1 **REP #:** 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0005 | *Astarte montagui* | 0.28 | 0.03 | 10.71 |

**STATION ID:** NULLZ-S **SURVEY:** 1 **REP #:** 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0006 | *Astarte montagui* | 0.20 | 0.02 | 10.00 |

# Bivalve Condition Index Data for Cook Inlet 1995 EMP

**STATION ID:** TRADB-S **SURVEY:** 1 **REP #:** 1

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0052 | *Yoldia amygdalea* | 0.52 | 0.11 | 21.15 |

**STATION ID:** TRADB-S **SURVEY:** 1 **REP #:** 2

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0053 | *Macoma spp.* | 0.28 | 0.03 | 10.71 |

**STATION ID:** TRADB-S **SURVEY:** 1 **REP #:** 3

| Sample ID | Taxon | Shell Volume (cc) | Tissue Weight (g) | Bivalve Condition Index |
|---|---|---|---|---|
| CIR95BCI0054 | *Macoma spp.* | 0.23 | 0.02 | 8.70 |