



HAWK INLET MONITORING PROGRAM
2025 ANNUAL REPORT



Hecla Greens Creek Mining Company

25 February 2026

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1. INTRODUCTION

1.1. Site Description

The Greens Creek Mine, located on Admiralty Island, is 18 miles southwest of Juneau, Alaska. Dense forests cover the mountain slopes up to an elevation of 2,500 feet, above which the vegetation is alpine. The climate is maritime, with precipitation averaging 60 to 70 inches per year at the mine site and 45 to 55 inches per year near the port facilities. The mine and mill facilities (920 area) are located over 6 miles from Hawk Inlet tidewater.

Zinc, lead, silver, and gold are the target recovery metals. The production of ore concentrate began in February 1989 and operated approximately four years before production was suspended in April 1993. The mine and mill were recommissioned, and operations restarted in mid-1996. A milling facility and support facilities are in place in the 920 area. Filter pressed tailings from the milling process are backfilled in the mine and deposited at a surface dry-stack tailings pile. Ore concentrate (concentrate) is transported from the mill to the Hawk Inlet port facilities area (Port) for storage until shipped. Support facilities for the mining and milling operation at the Port include rock core storage, concentrate storage, shift housing, and a domestic wastewater treatment plant.

Two wastewater discharge outfalls, 002A is not constructed yet, and eleven stormwater discharge sites are authorized under the Alaska Pollutant Discharge Elimination System (APDES) Permit Number AK-0043206. This report fulfills the requirements of APDES Permit Number AK-0043206, effective 1 October 2023.

Hawk Inlet is a marine inlet formed during the late Holocene glaciation and is underlain by a series of late-Paleozoic to Mesozoic phyllitic-schist and greenstone formations. Hawk Inlet extends seven miles north from Chatham Strait to a tidal mudflat estuary about 0.6 miles in diameter. The narrow channel connecting the Inlet to Chatham Strait, located between the top of the Greens Creek delta and the western shore of Hawk Inlet, has a minimum low tide depth of 35 feet. The mid-channel depth ranges from 35 feet to 250 feet. Hawk Inlet has regular, twice-daily tides, with a maximum tidal variation of 25 feet. The surface 35-foot layer contains the bulk of the water transport entering the inlet on the flood tide, flushed out on the ebb tide. Flushing describes the rate and extent to which tidal or other currents replenish a body of water. Flushing rates indicate the length of time that mining effluent may remain in a water body and become incorporated into the physical and biological ecosystem through ingestion, adsorption, or other means. Dispersion dye testing in Hawk Inlet (the 1980s) determined that over each tidal cycle, an average of 13 billion gallons of water is flushed from the inlet (SEA 1983). At that rate, Hawk Inlet is estimated to flush once every five tidal cycles. Based on the average daily discharge rate, the effluent is approximately 0.007% of the total volume flushed daily.

Greens Creek geology exploration began in 1973, which led to the predevelopment of mining operations in 1986. Before this, the Hawk Inlet cannery was constructed in 1910 and operated until it burned in 1976. It is estimated that the summer population at Hawk Inlet during cannery operation was 500. Additionally, up until 1946, gold was mined near Hawk Inlet, beginning in 1919 at the Alaska Empire Mine (Forest Service 2013). "In September 2014, the Forest Service conducted a Preliminary Assessment/Site Inspection of the Alaska Empire Mine site. Elevated concentrations of metals were found in the soil, sediment, surface water, and groundwater at the Upper Camp and soil stained by petroleum hydrocarbons. Tailings piles with elevated concentrations remain adjacent to the creek and continue to erode tailings into the creek." (Palmieri 2016).

1.2. Hawk Inlet Monitoring Program

In anticipation of the Greens Creek Mine development, government agencies, scientists, and biological consultants carried out surveys of marine life and baseline studies of heavy metals in the environment beginning in the early 1980s. The continual quarterly and annual monitoring programs have generated an extensive time-series data set of metal levels in the water, sediment, and marine tissue samples.

The Hawk Inlet monitoring program's primary objective is to document the water quality, sediment chemistry, and biological conditions in receiving waters and marine environments that the mine's operations may impact. Seawater is sampled quarterly at three locations in Hawk Inlet. Sediment and invertebrate samples are collected annually at three and seven spots, respectively (Figure 1-1).

Additional sediment samples are collected at two locations every five years. Table 1-1 summarizes the requirements of the permit for sample parameters, sample preservation and holding time, sampling frequency, analytical method, and required method detection limits (MDL). Specific quality assurance/quality control (QA/QC) requirements (i.e., sampling procedures, documentation, chain of custody processes, calibration procedures and frequency, data validation, corrective actions, etc.) are outlined in the APDES Quality Assurance Project Plan: Project Monitoring Manual (HGCMC 2024).

This report presents information on each of the media sampled in Hawk Inlet: water column, sediment, and in-situ bioassay. Results for the samples collected are presented along with the associated QA/QC data. Statistical evaluation of the data showing averages, variations, and changes over time are included. The next section describes any deviations from the monitoring program that occurred and the reasons why.

1.3. Deviation(s) from Monitoring Program and Incidents

According to Section 1.6.1.3, In-situ Bioassays, and Table 7 of the APDES permit, samples were not collected from site S-7 for polychaete worms (nephtys) as background data prior to construction of outfall 002A. Per Marine Taxonomic Services, nephtys are not collected at any of the submerged sites, such as site S-7.

1.4. Outfall 002 Pipeline and Diffuser Inspection

Along with the annual environmental monitoring, the Outfall 002 pipeline is inspected annually. On November 14, 2025, Global Diving & Salvage, Inc., surveyed the pipeline and diffuser for corrosion and damage. The report and video from the survey are in Appendix A. The following recommendations summarize the notable findings of the inspection:

- The Hawk Inlet pipeline outfall and diffuser are currently in good to excellent shape
- Global suggests replacing the anodes once their remaining capacity drops below 40%
- The type-4 anchor blocks on the diffuser, along with their anodes, are still in excellent condition
- Both the duckbill flanges and pipeline flange areas, including their respective anodes, are considered satisfactory
- Continued annual monitoring for 2026 is recommended, including monitoring anode conditions on flanges and bolts
- During the next diver deployment on-site, reassemble weight #18. This separation does not appear to impact the line's intended function or operation. During reassembly, if the existing bolts cannot be reused with additional nuts, at a minimum, position the top section over the bolts and secure the weight using a stainless-steel ratchet strap.

Table 1-1: Summary of Permit Sampling Requirements for Hawk Inlet

| APDES Requirement | Parameter | Frequency | Type | Sample Container | Sample Preservation | Laboratory | Hold Times | Analytical Method(s) | Minimum Required Method Detection Limit | Units | | | |
|--|------------------------|-----------|------|----------------------------------|-----------------------------------|---------------------|----------------|------------------------|---|--------|--------------------|----|----------|
| RECEIVING WATER COLUMN MONITORING | | | | | | | | | | | | | |
| 1.6.1.1.3 Table 5 | Dissolved Cadmium | Quarterly | Grab | 1 ea. 125 ml HDPE bottle | HNO ₃ to pH <2 by lab | Brooks Applied Labs | 180 day | EPA 213.2/1638 | 0.10 | µg/L | | | |
| 1.6.1.1.3 Table 5 | Dissolved Copper | | | (1 bottle for Cd, Cu, Pb, Zn) | | | | EPA 220.2/1638 | 0.03 | µg/L | | | |
| 1.6.1.1.3 Table 5 | Dissolved Lead | | | EPA 239.2/1638 | | | | 0.05 | µg/L | | | | |
| 1.6.1.1.3 Table 5 | Dissolved Zinc | | | EPA 289.2/1638 | | | | 0.200 | µg/L | | | | |
| 1.6.1.1.3 Table 5 | Total Mercury | | | 1 ea. 125 ml FLPE bottle | Cool to 4°C | ACZ Labs | 28 day | EPA 245.1/1631 | EPA 245.1/1631 | 0.002 | µg/L | | |
| 1.6.1.1.3 Table 5 | Total Suspended Solids | | | 1 ea. 500 ml plastic bottle | | | | | | 7 day | EPA 160.2/SM 2540D | -- | mg/L |
| 1.6.1.1.3 Table 5 | WAD Cyanide | | | 1 ea. 500 ml plastic bottle | NaOH to pH >12, cool to 4°C | Field Measurement | 14 day | EPA 335.2/SM 4500-CN-E | EPA 335.2/SM 4500-CN-E | 5.00 | µg/L | | |
| 1.6.1.1.3 Table 5 | Turbidity | | | 1 ea. 125 ml plastic bottle | Cool to 4°C | | | | | 2 day | NA | -- | NTU |
| 1.6.1.1.3 Table 5 | pH | | | NA | NA | Field Measurement | 15 min | NA | NA | -- | SU | | |
| 1.6.1.1.3 Table 5 | Conductivity | | | NA | NA | | | | | 20 min | NA | -- | µmhos/cm |
| 1.6.1.1.3 Table 5 | Temperature | | | NA | NA | | | | | 15 min | NA | -- | °C |
| BIOACCUMULATION WATER SEDIMENT MONITORING | | | | | | | | | | | | | |
| 1.6.1.2.3 Table 6 | Total Cadmium | Annual | Grab | 6 ea. 8 oz. plastic or glass jar | Chill and ice sample (not frozen) | ALS | 180 day | PSEP/GFAA | 0.30 | mg/Kg | | | |
| 1.6.1.2.3 Table 6 | Total Copper | | | | | | | PSEP/ICP | 15.00 | mg/Kg | | | |
| 1.6.1.2.3 Table 6 | Total Lead | | | | | | | PSEP/ICP | 0.50 | mg/Kg | | | |
| 1.6.1.2.3 Table 6 | Total Mercury | | | | | | | PSEP/ EPA 7471A | 0.02 | mg/Kg | | | |
| 1.6.1.2.3 Table 6 | Total Zinc | | | | | | PSEP/ICP | 15.00 | mg/Kg | | | | |
| BIOACCUMULATION WATER IN-SITU BIOASSAY MONITORING | | | | | | | | | | | | | |
| 1.6.1.3.2 Table 7 | Total Cadmium | Annual | Grab | 6 ea. 8 oz. plastic or glass jar | Chill and ice sample (not frozen) | ALS | 180 day | EPA 200.8/6020 | not specified | mg/Kg | | | |
| 1.6.1.3.2 Table 7 | Total Copper | | | | | | | EPA 200.8/6020 | not specified | mg/Kg | | | |
| 1.6.1.3.2 Table 7 | Total Lead | | | | | | | EPA 200.8/6020 | not specified | mg/Kg | | | |
| 1.6.1.3.2 Table 7 | Total Mercury | | | | | | | EPA 7471A | not specified | mg/Kg | | | |
| 1.6.1.3.2 Table 7 | Total Zinc | | | | | | EPA 200.8/6020 | not specified | mg/Kg | | | | |

2. WATER COLUMN MONITORING

The receiving water column monitoring requirements originate from Part 1.6.1.1 and Table 5 of the APDES permit. The receiving water column monitoring element of the sampling program aims to provide scientifically valid data on specific physical and chemical parameters for Hawk Inlet water quality. These data are used to evaluate potential changes in the Hawk Inlet marine environment.

Seawater samples are collected quarterly from the sites on an outgoing tide, with the Chatham Strait sample (Site 106) collected just after low, slack water. The two other sites are Site 107, located about mid-way east-west in Hawk Inlet, west of the ship loader facility, and Site 108, located proximally to the Outfall 002 diffuser at the edge of the mixing zone. Per 1.6.1.1, permitted 002A outfall has not been constructed at this time and no samples are reported for Site 111, adjacent to its proposed location.

Samples at all the receiving water column monitoring locations listed above are taken at a depth of five feet. The sample timing in each quarter is tide and weather dependent. As required by Permit Part 1.6.3.2, quarterly receiving water sample collection occurs on the same day as effluent sample collection.

The laboratory used for analysis of dissolved metals (Cd, Cu, Pb, and Zn) and low-level mercury was changed in 2023 to Brooks Applied Labs in Seattle, Washington. ACZ Laboratories in Steamboat Springs, Colorado analyze samples for WAD CN and total suspended solids. Temperature, pH, turbidity, and conductivity are measured in the field by HGCMC personnel.

2.1. Analytical Results

The tables in this section summarize the results for the quarterly water column monitoring.

Table 2-1: Hawk Inlet Field Parameters

| Quarter | Sample date | Site Number | Sample Time | Water Temperature (°C) | pH (s.u.) | Conductivity (µmhos/cm @ 25°C) | Turbidity (NTU) |
|---------|-------------|-------------|-------------|------------------------|-----------|--------------------------------|-----------------|
| 1 | 21-Jan-25 | 106 | 12:15 | 4.7 | 8.0 | 52,600 | 0.0 |
| | | 107 | 13:30 | 4.5 | 7.7 | 52,600 | 0.0 |
| | | 108 | 12:35 | 4.3 | 7.9 | 51,500 | 0.1 |
| 2 | 1-Apr-25 | 106 | 09:55 | 4.5 | 7.6 | 53,700 | 1.2 |
| | | 107 | 11:05 | 4.8 | 7.7 | 53,500 | 0.6 |
| | | 108 | 10:10 | 4.6 | 7.6 | 53,600 | 0.3 |
| 3 | 29-Jul-25 | 106 | 10:50 | 14.3 | 7.9 | 46,700 | 0.1 |
| | | 107 | 12:00 | 13.9 | 7.5 | 47,750 | 0.4 |
| | | 108 | 11:00 | 13.6 | 6.7 | 47,570 | 0.8 |
| 4 | 27-Oct-25 | 106 | 10:45 | 8.2 | 7.7 | 49,090 | 0.2 |
| | | 107 | 11:50 | 8.0 | 7.6 | 48,200 | 0.1 |
| | | 108 | 11:05 | 7.6 | 7.6 | 47,330 | 0.2 |

Table 2-2: Hawk Inlet Water Column Monitoring

| Sample Quarter | Site | TSS (mg/L) | WAD CN (µg/L) | Cd (µg/L) Dissolved | Cu (µg/L) Dissolved | Hg (µg/L) Total | Pb (µg/L) Dissolved | Zn (µg/L) Dissolved |
|----------------|-----------------|------------|---------------|---------------------|---------------------|-----------------|---------------------|---------------------|
| | <i>Lab MDL</i> | (5.0) | (3.0) | (0.002) | (0.023) | (0.0001) | (0.005) | (0.042) |
| | <i>Req. MDL</i> | | (5.0) | (0.10) | (0.03) | (0.002) | (0.05) | (0.20) |
| 1 | 106 | 14.00 | <3 | 0.08 | 0.21 | 0.0001 | 0.01 | 0.38 |
| | 107 | 6.00 | <3 | 0.08 | 0.22 | 0.0002 | 0.01 | 0.50 |
| | 108 | 8.00 | <3 | 0.09 | 0.26 | 0.0004 | 0.01 | 0.54 |
| 2 | 106 | 19.00 | 5.30 | 0.09 | 0.23 | 0.0001 | 0.01 | 0.34 |
| | 107 | 18.00 | <3 | 0.08 | 0.23 | 0.0003 | 0.01 | 0.41 |
| | 108 | 15.00 | <3 | 0.09 | 0.22 | 0.0001 | 0.01 | 0.43 |
| 3 | 106 | 23.00 | <3 | 0.05 | 0.23 | 0.0006 | 0.01 | 0.09 |
| | 107 | 22.00 | <3 | 0.06 | 0.23 | 0.0004 | 0.01 | 0.15 |
| | 108 | 21.00 | <3 | 0.06 | 0.23 | 0.0004 | 0.11 | 0.10 |
| 4 | 106 | 62.00 | <3 | 0.08 | 0.28 | 0.0001 | 0.01 | 0.33 |
| | 107 | 20.00 | <3 | 0.09 | 0.34 | 0.0002 | 0.01 | 0.57 |
| | 108 | 24.00 | <3 | 0.08 | 0.36 | 0.0003 | 0.11 | 0.60 |

2.2. Data Evaluation

Figures 2-1a, b, c through 2-7a, b, c show the time series plots of field pH, conductivity, cadmium, copper, lead, mercury, and zinc for stations 106 (2-1a through 2-7a), 107 (2-1b through 2-7b) and 108 (2-1c through 2-7c). The Alaska Water Quality Standards (AWQS) for marine aquatic life – chronic levels are shown or noted on the relevant graphs. The graphs show that Hawk Inlet water quality has remained within AWQS standards for all samples.

Figures 2-8a through 2-8f are the comparative time series plots of field pH, cadmium, copper, lead, mercury, and zinc from the last 10 years for station 108 and Outfall 002. The graphs demonstrate that the mixing zone authorized by the APDES permit is protective of the AWQS for all measured parameters.

Table 2-3 compares monitoring results averaged from the previous five years (n=20) and last year's (n=4) results at the three seawater monitoring locations. Cd metal concentrations in 2025 were slightly elevated, while Zn, Cu, and Hg average metal concentrations in 2025 were below their respective five-year averages. Apart from site 108, specifically Q3 and Q4 (Table 2-2), average Pb metal concentrations in 2025 were below their respective five-year averages. HGCMC will continue to monitor these trends for any abnormalities. Overall, the results for the reporting period remained near the last five-year average and well below saltwater AWQS standards for Pb and Zn, 8.05µg/L and 81.5µg/L; respectively.

Table 2-3: Hawk Inlet Water Column Average Dissolved Metal Concentrations

| Site | Cd (µg/L) | | Cu (µg/L) | | Pb (µg/L) | | Hg (Total - µg/L) | | Zn (µg/L) | |
|------|-------------------|-------|-------------------|-------|-------------------|-------|-------------------|--------|-------------------|-------|
| | 2020 through 2024 | 2025 | 2020 through 2024 | 2025 |
| 106 | 0.070 | 0.077 | 0.294 | 0.239 | 0.027 | 0.005 | 0.0005 | 0.0003 | 0.631 | 0.285 |
| 107 | 0.076 | 0.078 | 0.339 | 0.256 | 0.009 | 0.005 | 0.0005 | 0.0003 | 0.619 | 0.409 |
| 108 | 0.076 | 0.079 | 0.456 | 0.267 | 0.022 | 0.058 | 0.0005 | 0.0003 | 0.966 | 0.416 |

2.3. Laboratory QA/QC Results

Brooks Applied Labs and ACZ Laboratories analyzed the required parameters (refer to Table 1-1) in the seawater samples. Complete QA plans and reports are kept on file in each laboratory's office and are available upon request. This section summarizes the relevant laboratory QA/QC results from each laboratory for the quarterly seawater samples.

Low level dissolved trace metals analyses in saltwater matrices:

1Q: The analytes of interest were found at detectable levels in all field samples, apart from Pb at sites 107 and 106, and Hg at site 106, which were below the permitted MDL. Pb was found at a laboratory detectable level for site 108 (.0068 ug/L) but reported as below the permitted MDL (.05 ug/L). Concentrations in the method blanks were less than the laboratory MDL for all metals. Only sample results reported for mercury were method blank corrected. Target detection limits (TDLs) were met for all metals. Standard reference material (SRM), matrix spike, and duplicate results were within the default criteria 75-125%, 75-125%, and $\pm 20\%$; respectively.

2Q: The analytes of interest were found at detectable levels in all field samples, with the exception of Pb at sites 106 and 107, and Hg at sites 106, 107, and 108. Concentrations in the method blanks were less than the laboratory MDL for all metals, apart from Hg. The Hg method blank average was 2.0 times the laboratory MDL (.00013 ug/L). No corrective actions were taken as this was below the laboratory MRL (0.00040 ug/L) and below the permitted MDL (0.002 ug/L). Only sample results reported for mercury were method blank corrected. Trip blank results were below the laboratory MDL for all metals, with the exception of Hg, which was detected at 1.62 times the laboratory MDL (0.00013 ug/L). No corrective actions were taken considering the Hg trip blank average (0.00026 ug/L) was less than the laboratory reporting limit (0.00040 ug/L). Target detection limits (TDLs) were met for all metals. Standard reference material (SRM), matrix spike, and duplicate results were within the default criteria 75-125%, 75-125%, and $\pm 20\%$; respectively. For instances where the native sample results and/or associated duplicate result were below the MDL, the RPD was not calculated.

3Q: The analytes of interest were found at detectable levels in all field samples, apart from Pb at sites 106, 107, and 108 and Zn at sites 106 and 108. Concentrations in the method blanks were less than the laboratory MDL for all metals, with the exception of Hg. The Hg method blank average was 1.38 times the laboratory MDL (.00013 ug/L). No corrective actions were taken as this was below the laboratory MRL (0.00040 ug/L) and below the permitted MDL (0.002 ug/L). Only sample results reported for mercury were method blank corrected. Trip blank results were below the laboratory MDL for all metals. Target detection limits (TDLs) were met for all metals. Standard reference material (SRM), matrix spike and duplicate results were within the default criteria.

4Q: The analytes of interest were found at detectable levels in all field samples, apart from Pb and Hg at site 106. Concentrations in the method blank were less than the laboratory MDL for all metals. Only sample results reported for mercury were method blank corrected. Trip blank results were below the MDL for all metals, with the exception of Zn, which was detected at 2.67 times the laboratory MDL (0.090 ug/L). This sample was reanalyzed with confirming results. The original Zn trip blank result was reported as .24 ug/L, 1.2 times the permitted MDL of 0.20 ug/L; no further action could be taken. Target detection limits (TDLs) were met for all metals. Standard reference material (SRM), matrix spike and duplicate results were within the default criteria.

ACZ Laboratories (WAD cyanide analyses):

1Q: No certification qualifiers associated with this analysis.

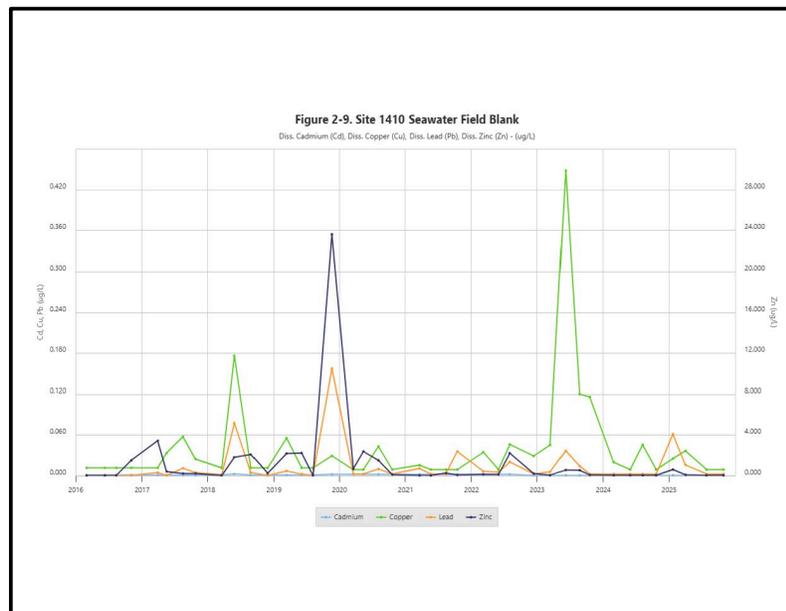
2Q: A WAD Cyanide result of 5.3 ug/L was detected at site 106, an assumed background site, at a value between laboratory MDL (3ug/L) and the laboratory Practical Quantitation Limit (10 ug/L).

3Q: No certification qualifiers associated with this analysis.

4Q: No certification qualifiers associated with this analysis.

2.4. Field Blank Results

In early 2023, HGCMC transitioned to a new laboratory for conducting dissolved metals and total mercury analysis. Results from samples collected at the monitoring sites continue to be well within water quality standards. Below are summaries of the field blank results per quarterly monitoring event. Field blanks are a QC procedure designed to detect possible contamination introduced from sampling equipment, handling by field personnel, and surrounding environmental conditions. Figure 2-9 (below), displays the field blank results over the past ten years.



1Q: Concentrations in the field blank sample were less than the permitted MDL for Cd, Cu, and Hg. Results for Pb and Zn were detected at 1.22 and 3.02 times the permitted MDL; respectively. The samples were reanalyzed confirming high results and the reported results were from the original analysis.

2Q: Concentrations in the field blank sample were less than the permitted MDL for Cd, Pb, Hg, and Zn. Cu was detected at 1.22 times the permitted MDL. Result reported from the original analysis, no further action could be taken.

3Q: Concentrations in the field blank sample were less than the permitted MDL for all metals.

4Q: Concentrations in the field blank sample were less than the permitted MDL for all metals.

3. SEDIMENT MONITORING

The sediment monitoring requirements originate from Section 1.6.1.2, Sediment Monitoring, and Table 6 of the APDES permit. This monitoring program element aims to provide scientifically valid data on five specific trace metal parameters analyzed as the dry weight (dw) from sediments at four Hawk Inlet locations (see Figure 1-1 for locations). These data are used to evaluate potential changes in the Hawk Inlet marine environment over time.

Sediment samples were collected semi-annually through 2015. With the re-issuance of the permit, the sampling frequency was changed to annual. Samples are collected at the Greens Creek delta (Site S-1), Pile Driver Cove near the mouth of the inlet (Site S-2), ~400 feet south of the concentrate loading facility (Site S-4), and under the loading facility at Sites S-5N and S-5S. Sites S-5N and S-5S were established in response to the 1989 concentrate spill. These two sites were sampled every five years per permit condition 1.6.1.2. The new permit issued in October 2023 requires these sites to be sampled every 3 years. Sampling sites S-1, S-2, and S-3 were chosen to represent natural conditions. The results from these sites from September 1984 until January 1989 were used to calculate baseline values.

Station S-3 near the head of Hawk Inlet, established initially as a background site, has been sampled for sediment and biota since the 1980s. Though dropped from the official sampling program with the permit reissuance in 2005, HGCMC continues to monitor the site yearly and has included the data in this report. This site is located adjacent to the abandoned Alaska Empire Mine site and its associated tailings, thus elevated metal concentrations at this site may not be indicative of natural background levels in Hawk Inlet (Palmieri 2016).

Station S-7 is located approximately one mile northwest of outfall 002 and approximately 1500ft. west-southwest from the TDF, directly adjacent to the proposed site of the permitted outfall 002A. This site has been sampled for sediment since 2022 to provide background data prior to construction of outfall 002A. An additional site requirement for in-situ bioassay monitoring of *Nephtys* is listed on the 2023 APDES permit, however this is a submerged site and is not attainable at this time.

Station S-8 is located approximately one-half mile due north of outfall 002, along the western shore of Hawk Inlet. This site has been sampled since 2022 to assess potential inputs from legacy mining operations and to assist with characterizing a stream adjacent to the 002 outfall.

Station S-9 is located approximately .25 miles due east of station S-7, along the eastern shore of Hawk Inlet. This site was first sampled in 2024 to assist with providing background data prior to construction of outfall 002A and as a part of the mitigation and monitoring measures listed in Table A-1, Aquatic Resources (AR)-1(e) of the 2024 North Expansion Project (NEP) Record of Decision (ROD) (USFS 2024). Sampling for this site includes sediment and an in-situ bioassay. Per AR-1, *'if the adjacent Atmospheric Deposition Container (ADC) indicates fugitive dust is being effectively mitigating, sampling at this location could be discontinued in coordination with (ADEC and) USFS.'*

Although stations S-7, S-8, and S-9 are not a part of the current 2023 APDES permit and official sampling program at the time of this reporting, HGCMC has included the data in this report.

3.1. Sediment Analytical Results

Marine Taxonomic Services, LTD collected all sediment samples. The sample locations, dates, times, weather conditions, and tides are shown in Table 3-1. Table 3-2 summarizes the total metals results for the sediment monitoring events. Sample replicates (reps) 1 through 6 were averaged for each sample site.

Samples are analyzed at ALS Environmental in Kelso, Washington, for total concentrations of cadmium, copper, lead, mercury, and zinc.

Table 3-1: Hawk Inlet Sediment Monitoring Field Parameters

| Locations | Sample Type | Date Sampled | Time Sampled (24 hour) | Air Temperature (°F) | Weather Conditions | Tide (ft MLLW) |
|-----------|-------------|--------------|------------------------|----------------------|--------------------|----------------|
| S-1 | Sediment | 5/27/2025 | 06:52 | 43 | Cloudy | -2.7 |
| S-2 | Sediment | 5/27/2025 | 07:43 | 44 | Cloudy | -4.4 |
| S-3 | Sediment | 5/31/2025 | 10:51 | 46 | Cloudy | -1.2 |
| S-4 | Sediment | 5/30/2025 | 09:42 | 45 | Cloudy | -1.2 |
| S-7 | Sediment | 5/28/2025 | 08:20 | 45 | Rainy | -4.2 |
| S-8 | Sediment | 5/29/2025 | 07:25 | 46 | Cloudy | 1.3 |
| S-9 | Sediment | 5/29/2025 | 08:20 | 46 | Cloudy | -1.8 |

3.2. Data Evaluation

Before opening the Greens Creek Mine for full production in 1989, 5 locations were chosen for sediment sampling for heavy metal concentrations. This data is valuable to compare metal values after mining began and the current year's sampling results. Sampling sites S-4 and S-5N, and S-5S are located near the ore concentrate loading facility. They are thought to have been influenced by the old industrial cannery operation and not representative of natural conditions. However, these sites were used to establish a pre-operational baseline condition.

Figures 3-1 through 3-5 show the time series plots for cadmium (Cd), copper (Cu), lead (Pb), mercury (Hg), and zinc (Zn), including replicate samples for sample site S-1. Figures 3-6 through 3-10 show the time series plots for including replicate samples for sample site S-2. Figures 3-11 through 3-15 show the time series plots for Cd, Cu, Pb, Hg, and Zn, including replicate samples for sample site S-3. Figures 3-16 through 3-20 show the time series plots for Cd, Cu, Pb, Hg, and Zn, including replicate samples for sample site S-4. Figures 3-21 through 3-25 show the time series plots for Cd, Cu, Pb, Hg, and Zn, including replicate samples for sample site S-7. Figures 3-26 through 3-30 show the time series plots for Cd, Cu, Pb, Hg, and Zn, including replicate samples for sample site S-8. And finally, Figures 3-31 through 3-35 show the time series plots for Cd, Cu, Pb, Hg, and Zn, including replicate samples for sample site S-9.

Replicate samples are plotted with a single point, representing the mean value of the data and error bars to represent the distribution. In 2004, replicate sampling began, and all replicate samples were included, plotted by the mean with standard error bars unless otherwise noted.

Table 3-2 shows the average metal concentrations and the associated standard deviations for each sediment sampling site during pre-production, production, and the current year.

At site S-1, located at the Greens Creek delta and closest to Outfall 002, average concentrations of heavy metals were less than or similar to the average production and pre-production period concentrations for all analytes, with the exception of Zn where 2025 values were slightly elevated compared to average production. However, the average Zn concentration at site S-1 in 2025 is lower when compared with the pre-production average.

At site S-2, the background site in Pile Driver Cove located approximately three miles south of the port facilities, average concentrations of all heavy metals during the reporting period were less than or similar to the production and pre-production period averages.

Site S-3 is located near Hawk Inlet's head and approximately four miles north of the Greens Creek Mine port facilities. The average concentrations for all metals during the reporting period were greater than, or similar to the pre-production and production averages at this location. Furthermore, the average metals concentrations were higher than those at the other sediment monitoring locations. Given this data and the spatial distance between the monitoring locations, it is evident that all metal inputs to Hawk Inlet are not associated with the Greens Creek Mine.

At site S-4, located approximately 400ft south of the concentrate storage facility, average concentrations of all metals were less than or similar to the average production period and pre-production period averages.

At site S-5N, the north Hawk Inlet facility site created in response to the 1989 concentration spill, sampling was not conducted in the reporting year and average concentrations of all metals are not discussed in this report.

At site S-5S, the south Hawk Inlet facility site created in response to the 1989 concentration spill, sampling was not conducted in the reporting year and average concentrations of all metals are not discussed in this report.

At site S-7, located adjacent to the proposed Outfall 002A, average concentrations of all metals were similar to or less than previous production period averages, 2022-2024. It is difficult to draw conclusions from this small data set as the information only goes back to 2022. Data from this site should be taken as background information until construction of Outfall 002A is finalized.

The dataset for site S-8, located on the western shore of Hawk Inlet approximately .5 miles due north of Outfall 002, only goes back to 2022 and is difficult to draw definitive conclusions from. This site, though not officially listed on the APDES permit, is useful to see other potential inputs not related to HGCMC mining operations and the need to further characterize elevated baseline values adjacent to the site.

Sampling for site S-9, located along the eastern shore of Hawk Inlet, was recently established as a sampling location in 2024. Due to the limited dataset, it is difficult to draw any definitive conclusions related to metal concentrations in the sediment. This site, not listed in the current APDES permit, was created to provide background data prior to construction of outfall 002A and as a part of the mitigation and monitoring measures listed in Table A-1, AR-1(e) of the 2024 NEP ROD (USFS 2024).

Table 3-2: Sediment Data Comparison of Pre-Production, Production, and Current Year Values

| Station | Period | Cd (mg/kg) | | Cu (mg/kg) | | Pb (mg/kg) | | Hg (mg/kg) | | Zn (mg/kg) | |
|---------|---|---------------|-------|---------------|-------|---------------|-------|---------------|-------|---------------|-------|
| | | Avg | Stdev |
| S-1 | Pre-Production (9/1984 - 2/1989) (n=9) | 0.22 | 0.11 | 21.78 | 3.8 | 7.79 | 2.1 | 0.043 | 0.012 | 125.01 | 7.7 |
| | Production (2/1989 - 12/2024) (n=160) | 0.17 | 0.18 | 15.84 | 6.9 | 6.96 | 3.8 | 0.030 | 0.027 | 99.66 | 30.7 |
| | Reporting Year 2025 (n=6) | 0.11 | 0.01 | 15.22 | 0.9 | 5.90 | 0.4 | 0.030 | 0.011 | 104.12 | 7.8 |
| S-2 | Pre-Production (9/1984 - 2/1989) (n=9) | 0.27 | 0.11 | 14.90 | 2.6 | 5.27 | 2.4 | 0.028 | 0.014 | 60.47 | 5.4 |
| | Production (2/1989 - 12/2024) (n=160) | 0.15 | 0.11 | 11.47 | 4.4 | 2.55 | 1.5 | 0.010 | 0.015 | 47.57 | 12.7 |
| | Reporting Year 2025 (n=6) | 0.10 | 0.01 | 10.40 | 1.4 | 1.93 | 0.2 | 0.010 | 0.001 | 44.53 | 2.8 |
| S-3 | Pre-Production (9/1984 - 2/1989) (n=9) | 0.62 | 0.28 | 37.00 | 9.1 | 10.03 | 3.3 | 0.067 | 0.019 | 127.03 | 49.8 |
| | Production (2/1989 - 12/2024) (n=160) | 0.81 | 0.33 | 40.37 | 10.9 | 15.40 | 4.4 | 0.080 | 0.034 | 144.50 | 35.8 |
| | Reporting Year 2025 (n=6) | 0.85 | 0.25 | 52.05 | 8.6 | 16.68 | 2.7 | 0.080 | 0.009 | 178.67 | 25.1 |
| S-4 | Pre-Production (9/1984 - 2/1989) (n=6) | 0.34 | 0.17 | 46.23 | 12.1 | 53.78 | 20.2 | 0.109 | 0.057 | 136.53 | 41.6 |
| | Production (2/1989 - 12/2024) (n=160) | 0.47 | 0.80 | 31.08 | 45.1 | 49.37 | 118.3 | 0.090 | 0.447 | 99.63 | 155.6 |
| | Reporting Year 2025 (n=6) | 0.21 | 0.02 | 20.77 | 5.6 | 10.57 | 1.2 | 0.030 | 0.001 | 54.23 | 4.8 |
| S-7 | Production (10/2022 - 12/2024) (n=18) | 0.30 | 0.071 | 14.92 | 2.9 | 8.82 | 1.60 | 0.040 | 0.006 | 79.23 | 22.21 |
| | Reporting Year 2025 (n=6) | 0.22 | 0.023 | 11.38 | 1.3 | 5.84 | 0.64 | 0.020 | 0.001 | 80.13 | 6.71 |
| S-8 | Production (10/2022 - 12/2024) (n=18) | 0.63 | 0.31 | 21.89 | 10.6 | 12.02 | 6.43 | 0.070 | 0.033 | 137.32 | 60.28 |
| | Reporting Year 2025 (n=6) | 0.15 | 0.02 | 10.00 | 2.4 | 5.22 | 0.74 | 0.010 | 0.001 | 47.02 | 5.73 |
| S-9 | Production (5/2024 - 12/2024) (n=6) | 0.06 | 0.01 | 9.53 | 1.2 | 17.07 | 20.63 | 0.030 | 0.00 | 39.90 | 2.43 |
| | Reporting Year 2025 (n=6) | 0.16 | 0.02 | 12.09 | 1.6 | 7.84 | 1.24 | 0.010 | 0.001 | 125.67 | 9.6 |

Note:

1. Non-detects are averaged using half of the MDL

3.3. QA/QC Results

ALS Environmental analyzed the required parameters (see Table 1-1) in the sediment samples. Complete QA plans and reports are kept on file at the ALS Environmental office and are available upon request. The remainder of this section summarizes any relevant QA/QC results that were exceptions during the reporting period.

Per the ALS Service Request – K2505627:

Method 200.8, 06/10/2025: The Relative Percent Difference (RPD) for the replicate analysis of Copper in sample S-4 Sed Rep III

was outside the normal ALS control limits. The variability in the results was attributed to the heterogeneous character of the sample. Standard mixing techniques were used but were not sufficient for complete homogenization of this sample.

No significant anomalies were noted with this analysis.

Replicate samples have been collected from each site, when possible, to address a National Marine Fisheries Service request since 2004. Replicate precision is evaluated using the Relative Standard Deviation (RSD).

$$\text{RSD} = (\text{standard deviation} * 100) / \text{sample mean}$$

The RSDs for the 2025 replicate samples are in Table 3-3.

The data quality objective for the RSD is that it is less than or equal to 30 percent when the values are at least four times the permitted detection limit for the sampled metal.

All RSD percentages calculated for the 2025 reporting period met or exceeded the data quality objective.

Table 3-3: Relative Standard Deviation for Replicate Sediment Samples

| Site | Rep | Sample Date | Cd | Cu | Pb | Hg | Zn |
|----------------|-----|-------------|------------|------------|-------------|------------|-------------|
| | | | (mg/kg dw) | (mg/kg dw) | (mg/kg dw) | (mg/kg dw) | (mg/kg dw) |
| S-1 Sediments | 1 | 5/27/2025 | 0.11 | 15.40 | 5.60 | 0.020 | 109.00 |
| | 2 | | 0.10 | 16.10 | 5.34 | 0.025 | 93.30 |
| | 3 | | 0.09 | 13.40 | 5.56 | 0.048 | 100.00 |
| | 4 | | 0.10 | 15.60 | 6.17 | 0.045 | 98.40 |
| | 5 | | 0.11 | 15.80 | 6.39 | 0.030 | 107.00 |
| | 6 | | 0.13 | 15.00 | 6.32 | 0.025 | 117.00 |
| RSD (%) | | | -- | -- | 7.6 | -- | 8.2 |
| S-2 Sediments | 1 | 5/27/2025 | 0.10 | 8.56 | 1.65 | <0.022 | 43.10 |
| | 2 | | 0.12 | 11.80 | 2.03 | <0.022 | 44.80 |
| | 3 | | 0.11 | 9.64 | 1.93 | <0.022 | 43.90 |
| | 4 | | 0.09 | 11.80 | 1.95 | <0.025 | 49.30 |
| | 5 | | 0.10 | 11.60 | 2.21 | <0.022 | 40.20 |
| | 6 | | 0.11 | 8.97 | 1.83 | <0.024 | 45.90 |
| RSD (%) | | | -- | -- | 9.7 | -- | -- |
| S-3 Sediments | 1 | 5/31/2025 | 0.99 | 54.80 | 16.30 | 0.07 | 177.00 |
| | 2 | | 0.93 | 58.40 | 21.20 | 0.09 | 206.00 |
| | 3 | | 0.80 | 48.30 | 14.00 | 0.07 | 170.00 |
| | 4 | | 1.24 | 63.80 | 16.70 | 0.09 | 204.00 |
| | 5 | | 0.44 | 36.40 | 13.10 | 0.07 | 131.00 |
| | 6 | | 0.73 | 50.60 | 18.80 | 0.08 | 184.00 |
| RSD (%) | | | -- | -- | 18.0 | -- | 15.4 |

Notes:

1. A '--' indicates RSD was not calculated because three or more of the values were less than 4 times the MRL.
2. A '<' denotes the sample was analyzed, but was not detected above the MRL/MDL.

Table 3-3 Continued: Relative Standard Deviation for Replicate Sediment Samples

| Site | Rep | Sample Date | Cd | Cu | Pb | Hg | Zn |
|----------------|-----|-------------|------------|------------|-------------|------------|------------|
| | | | (mg/kg dw) | (mg/kg dw) | (mg/kg dw) | (mg/kg dw) | (mg/kg dw) |
| S-4 Sediments | 1 | 5/30/2025 | 0.22 | 29.20 | 10.40 | <0.022 | 56.20 |
| | 2 | | 0.22 | 14.40 | 10.10 | 0.03 | 48.80 |
| | 3 | | 0.24 | 15.40 | 10.60 | 0.02 | 54.10 |
| | 4 | | 0.19 | 25.10 | 13.00 | <0.024 | 61.10 |
| | 5 | | 0.21 | 16.60 | 10.40 | 0.03 | 57.60 |
| | 6 | | 0.19 | 23.90 | 8.90 | 0.02 | 47.60 |
| RSD (%) | | | -- | -- | 12.7 | -- | -- |
| S-7 Sediments | 1 | 5/28/2025 | 0.22 | 10.60 | 5.76 | <0.031 | 79.7 |
| | 2 | | 0.19 | 11.50 | 6.28 | <0.029 | 91.6 |
| | 3 | | 0.22 | 10.70 | 5.75 | <0.03 | 77.5 |
| | 4 | | 0.20 | 9.77 | 4.70 | <0.032 | 69.9 |
| | 5 | | 0.21 | 11.80 | 5.73 | <0.031 | 77.5 |
| | 6 | | 0.26 | 13.90 | 6.82 | <0.029 | 84.6 |
| RSD (%) | | | -- | -- | 12.1 | -- | 9.2 |
| S-8 Sediments | 1 | 5/29/2025 | 0.12 | 7.38 | 5.33 | <0.027 | 43.5 |
| | 2 | | 0.12 | 13.90 | 5.68 | <0.024 | 53.2 |
| | 3 | | 0.18 | 10.40 | 3.80 | <0.027 | 54.0 |
| | 4 | | 0.16 | 11.30 | 5.71 | <0.028 | 45.1 |
| | 5 | | 0.15 | 7.06 | 4.78 | <0.031 | 37.5 |
| | 6 | | 0.14 | 11.40 | 5.99 | <0.03 | 48.8 |
| RSD (%) | | | -- | -- | 15.5 | -- | -- |
| S-9 Sediments | 1 | 5/29/2025 | 0.14 | 9.96 | 7.25 | <0.02 | 119.0 |
| | 2 | | 0.15 | 14.00 | 10.30 | <0.019 | 141.0 |
| | 3 | | 0.13 | 11.50 | 6.88 | <0.022 | 126.0 |
| | 4 | | 0.16 | 13.70 | 7.41 | <0.021 | 122.0 |
| | 5 | | 0.18 | 13.00 | 8.52 | <0.023 | 112.0 |
| | 6 | | 0.18 | 10.40 | 6.69 | <0.021 | 134.0 |
| RSD (%) | | | -- | -- | 17.4 | -- | 8.3 |

Notes:

1. A '--' indicates RSD was not calculated because three or more of the values were less than 4 times the MRL.
2. A '<' denotes the sample was analyzed, but was not detected above the MRL/MDL.

4. IN-SITU BIOASSAYS

The bioassay monitoring requirements originate from Section 1.6.1.3, In-situ Bioassays, and Table 7 of the APDES permit. This monitoring element's objective is to provide scientifically valid data on five specific trace metal parameters analyzed at dry weight from the tissues of polychaete worms (*Nephtys*) and blue mussels (*Mytilus edulis*) at seven locations in Hawk Inlet for evaluating potential changes in the Hawk Inlet marine environment. Though not listed on the APDES permit, additional sites were sampled for polychaete worms (S-3, S-8, and S-9) and are listed in the table below.

Bioaccumulation in-situ bioassay sampling in Hawk Inlet consists of annual testing of trace metal tissue burdens of selected species of invertebrate organisms with different feeding guilds. In the Hawk Inlet sill area, where no fine-grained sediments occur, monitoring trace metals in blue mussels occur at six sites [Stations STN-1, STN-2, STN-3, STN-4 (East Shoal Light (ESL), STN-5, and STN-6). Data gathered from STN-1, STN-2, STN-3, and STN-4 (ESL) measures organisms' response near the Outfall 002 discharge. Data gathered from STN-5 and STN-6 measures organisms' response near the Outfall 002A discharge, yet to be constructed. In most other regions of Hawk Inlet, the bottom is covered with sediment. Consequently, samples of sediment-dwelling polychaete worms (*Nephtys procera* and *Nereis sp.*) are collected at six additional sites (S-1, S-2, S-3, S-4, S-8, and S-9). *Nereis sp* were not encountered in sufficient numbers for analysis during the reporting period, so only *Nephtys* were collected.

4.1. Analytical Results

Marine Taxonomic Services, LTD collected all tissue samples (Table 4-1).

Table 4-1: Hawk Inlet Tissue Sampling Field Data

| Locations | Sample Type | Date Sampled | Time Sampled (24 hour) | Air Temperature (°F) | Weather Conditions | Tide (ft MLLW) |
|-----------|-------------|--------------|------------------------|----------------------|--------------------|----------------|
| S-1 | Nephtys | 5/27/2025 | 07:15 | 43 | Cloudy | -2.9 |
| S-2 | Nephtys | 5/27/2025 | 08:10 | 44 | Cloudy | -4.3 |
| S-3 | Nephtys | 5/31/2025 | 10:51 | 46 | Cloudy | -1.2 |
| S-4 | Nephtys | 5/30/2025 | 09:42 | 45 | Cloudy | -2.2 |
| S-8 | Nephtys | 5/29/2025 | 11:36 | 47 | Cloudy | 0.08 |
| S-9 | Nephtys | 5/29/2025 | 10:03 | 47 | Cloudy | -3.4 |
| STN-1 | Mussels | 5/28/2025 | 11:15 | 46 | Rainy | 2.8 |
| STN-2 | Mussels | 5/28/2025 | 12:22 | 46 | Rainy | 7.2 |
| STN-3 | Mussels | 5/28/2025 | 11:15 | 46 | Rainy | 2.8 |
| ESL | Mussels | 5/28/2025 | 10:45 | 46 | Rainy | 0.1 |
| STN-5 | Mussels | 5/29/2025 | 07:30 | 46 | Cloudy | 0.9 |
| STN-6 | Mussels | 5/29/2025 | 09:34 | 47 | Cloudy | -3.6 |

4.2. Data Evaluation

Biota tissues were sampled for heavy metal concentrations before opening the Greens Creek Mine for full production in 1989. Results for mussels from sites STN-1, STN-2, STN-3, and ESL, and *Nephtys* from sites S-1, S-2, and S-3 from September of 1984 until January of 1989 were used to calculate baseline, pre-production values. These data are helpful as baseline values against which to compare metal values after mining began and the current year's sampling results.

As noted by the Oceanographic Institute of Oregon in the 1998 Kennecott Greens Creek Mine Risk Assessment (p 4-3),

“Sampling stations were selected to demonstrate a range of potential exposures including “worst case” exposure to Outfall discharges. Some of the test organisms placed in cages directly on the Outfall diffuser ports lived for six months. These results indicate that even maximum exposure to the Outfall discharge results in no acute effects.”

The average and standard deviation results for pre-production, production, and current year periods for mussels are provided in Table 4-2.

In the reporting period, lead (Pb) concentration averages were lower than or similar to the pre-production and production periods for all sampling sites, with the exception of sites STN-5 and STN-6. STN-5 and STN-6 do not have pre-production datasets and production values are only captured from 2022-2024.

Zinc (Zn) concentration averages were higher than or similar to the production and pre-production periods for all sampling sites during the current reporting period.

Mercury (Hg) concentration averages for this reporting period were lower than or similar to the production and pre-production periods for all sampling sites, with the exception of sites STN-5 and STN-6. STN-5 and STN-6 do not have pre-production datasets and production values are only captured from 2022-2024.

Copper (Cu) concentration averages were lower than or similar to the pre-production and production periods for all sampling sites during this reporting period, with the exception of sites STN-5 and STN-6. STN-5 and STN-6 do not have pre-production datasets and production values are only captured from 2022-2024.

Cadmium (Cd) concentration averages during this reporting period were higher than or similar to the production and pre-production periods for all sampling sites.

Figures 4-1 through 4-30 show the time series plots for cadmium, copper, lead, mercury, and zinc, including replicate samples in mussels for sample sites: STN-1, STN-2, STN-3, STN-4 (ESL), STN-5, and STN-6.

Table 4-2: Average and Standard Deviation Values for Pre-Production, Production, and Current Year Mussel Data

| Station | Period | Cd | | Cu | | Pb | | Hg | | Zn | |
|---------|--|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|
| | | (mg/kg) | | (mg/kg) | | (mg/kg) | | (mg/kg) | | (mg/kg) | |
| | | Avg | Stdev |
| STN-1 | Pre-Production (9/1984 - 12/1989) (n=9) | 7.41 | 1.80 | 7.96 | 1.20 | 0.62 | 0.41 | 0.07 | 0.09 | 94.92 | 11.21 |
| | Production (2/1989- 12/2024) (n=110) | 9.02 | 1.95 | 7.54 | 2.26 | 1.07 | 0.68 | 0.04 | 0.02 | 92.53 | 22.84 |
| | Reporting Year 2025 (n=6) | 12.12 | 0.22 | 7.06 | 0.22 | 0.86 | 0.05 | 0.04 | 0.00 | 113.00 | 2.58 |
| STN-2 | Pre-Production (9/1984 - 12/1989) (n=9) | 8.60 | 3.10 | 7.71 | 1.05 | 0.37 | 0.19 | 0.04 | 0.01 | 82.36 | 11.20 |
| | Production (2/1989- 12/2024) (n=110) | 9.19 | 1.65 | 7.86 | 2.58 | 1.08 | 0.48 | 0.04 | 0.02 | 91.24 | 21.72 |
| | Reporting Year 2025 (n=6) | 13.07 | 0.21 | 7.95 | 0.13 | 0.62 | 0.03 | 0.05 | 0.00 | 105.67 | 2.13 |
| STN-3 | Pre-Production (9/1984 - 12/1989) (n=9) | 9.27 | 3.05 | 8.50 | 1.69 | 0.59 | 0.21 | 0.04 | 0.01 | 95.73 | 17.80 |
| | Production (2/1989- 12/2024) (n=110) | 9.11 | 2.06 | 7.53 | 1.76 | 1.06 | 0.54 | 0.04 | 0.02 | 91.65 | 13.48 |
| | Reporting Year 2025 (n=6) | 13.37 | 0.25 | 7.10 | 0.11 | 0.66 | 0.06 | 0.05 | 0.00 | 107.00 | 1.63 |
| ESL | Pre-Production (9/1984- 2/1989) (n=9) | 6.67 | 1.60 | 8.16 | 0.68 | 0.42 | 0.11 | 0.03 | 0.01 | 91.40 | 8.38 |
| | Production (2/1989- 12/2024) (n=110) | 6.48 | 1.50 | 9.24 | 2.73 | 0.96 | 0.24 | 0.03 | 0.02 | 83.36 | 14.31 |
| | Reporting Year 2025 (n=6) | 7.83 | 0.10 | 8.61 | 0.13 | 0.52 | 0.01 | 0.04 | 0.00 | 108.83 | 2.03 |
| STN-5 | Production (1/2022- 12/2024) (n=18) | 4.42 | 0.61 | 5.64 | 0.54 | 0.59 | 0.15 | 0.02 | 0.01 | 76.71 | 11.66 |
| | Reporting Year 2025 (n=6) | 7.97 | 0.16 | 8.10 | 0.10 | 0.93 | 0.08 | 0.05 | 0.00 | 110.17 | 2.03 |
| STN-6 | Production (1/2022- 12/2024) (n=18) | 5.25 | 0.55 | 6.32 | 0.84 | 0.75 | 0.53 | 0.03 | 0.01 | 79.08 | 14.27 |
| | Reporting Year 2025 (n=6) | 8.74 | 0.26 | 8.06 | 0.11 | 0.79 | 0.04 | 0.05 | 0.00 | 115.67 | 1.97 |

Note:

1. Non-detects are averaged using half of the MRL/MDL

The metal concentrations in *Nephtys* are shown in Table 4-3. There is no data and samples were not collected for site S-7, a background site for the future 002A outfall (not constructed as of the writing of this report), as listed in the APDES permit.

In the reporting period, Zinc (Zn) concentration averages were similar to the production and pre-production periods for all permitted sampling sites. Sites S-1 and S-2 showed slightly lower zinc concentrations when compared to production and pre-production periods. Sites S-3 and S-4 showed slightly elevated zinc concentrations when compared with production and pre-production periods. Site S-8, a non-permitted site located on the western shore of Hawk Inlet, does not have enough historical Zn concentration average data to draw definitive conclusions from. This site was established with the intent of characterizing potential background inputs to the currently permitted sample area. Site 2-9, a non-permitted site located on the eastern shore of Hawk Inlet, also does not have enough historical Zn concentration average data to draw definitive conclusions from. This site was established in 2024 to assist with providing background data prior to construction of outfall 002A and as a part of the mitigation and monitoring measures listed in Table A-1, Part AR-1(e) of the 2024 NEP ROD (USFS 2024).

Cadmium (Cd) and Copper (Cu) concentration averages were lower than or similar to the production and pre-production periods for all permitted sample sites. Site 9 does not have enough historical Cd and Cu concentration average data to draw definitive conclusions from. As described above, this non-permitted site was established under Table A-1, AR-1(e) of the 2024 NEP ROD. (USFS 2024)

Lead (Pb) concentration averages were lower than or similar to the production and pre-production periods for all permitted and non-permitted sample sites.

Mercury (Hg) concentration averages were lower than or similar to the production and pre-production periods for all permitted and non-permitted sample sites.

Figures 4-31 through 4-60 show the time series plots for cadmium, copper, lead, mercury, and zinc, including replicate samples in *Nephtys* for sample sites: S-1, S-2, S-3, S-4 (ESL), S-8, and S-9. Replicate samples are plotted by the mean and include standard error bars. Samples from site S-3, S-8, and S-9 are being collected, although not required by the APDES permit. This data is included in the table below to provide additional background information.

Table 4-3: Average and Standard Deviation Values for Pre-Production, Production, and Current Year Nephtys Data

| Station | Period | Cd | | Cu | | Pb | | Hg | | Zn | |
|---------|--|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|
| | | (mg/kg) | | (mg/kg) | | (mg/kg) | | (mg/kg) | | (mg/kg) | |
| | | Avg | Stdev |
| S-1 | Pre-Production (9/1984- 2/1989) (n=9) | 4.00 | 1.61 | 9.04 | 1.12 | 0.49 | 0.15 | 0.05 | 0.01 | 243.6 | 40.1 |
| | Production (2/1989- 12/2024) (n=158) | 2.75 | 0.93 | 9.93 | 2.87 | 0.98 | 0.64 | 0.04 | 0.02 | 207.7 | 28.8 |
| | Reporting Year 2025 (n=6) | 1.70 | 0.02 | 5.76 | 0.17 | 0.70 | 0.04 | 0.03 | 0.01 | 184.2 | 2.1 |
| S-2 | Pre-Production (9/1984- 2/1989) (n=9) | 1.70 | 0.70 | 12.37 | 3.12 | 0.59 | 0.22 | 0.02 | 0.01 | 181.1 | 27.7 |
| | Production (2/1989- 12/2024) (n=152) | 1.15 | 0.34 | 8.61 | 2.03 | 0.69 | 0.20 | 0.02 | 0.01 | 173.6 | 20.3 |
| | Reporting Year 2025 (n=6) | 1.44 | 0.03 | 7.56 | 0.25 | 0.38 | 0.01 | 0.04 | 0.02 | 172.0 | 2.0 |
| S-3 | Pre-Production (9/1984- 2/1989) (n=8) | 4.08 | 2.45 | 16.45 | 4.92 | 0.82 | 0.45 | 0.14 | 0.22 | 241.4 | 70.7 |
| | Production (2/1989- 12/2024) (n=156) | 1.88 | 0.54 | 13.57 | 5.49 | 0.85 | 0.44 | 0.04 | 0.02 | 233.6 | 30.0 |
| | Reporting Year 2025 (n=6) | 1.47 | 0.02 | 8.31 | 0.22 | 0.44 | 0.04 | 0.04 | 0.01 | 268.5 | 3.5 |
| S-4 | Pre-Production (9/1984- 2/1989) (n=2) | 1.21 | 0.70 | 16.80 | 6.70 | 4.16 | 1.27 | 0.11 | 0.06 | 193.5 | 10.5 |
| | Production (2/1989- 12/2024) (n=158) | 0.79 | 0.31 | 16.84 | 9.57 | 6.13 | 1.11 | 0.02 | 0.01 | 191.2 | 20.5 |
| | Reporting Year 2025 (n=6) | 1.02 | 0.03 | 14.33 | 0.43 | 2.78 | 0.06 | 0.07 | 0.01 | 194.2 | 4.5 |
| S-8 | Production (10/2022- 12/2024) (n=18) | 2.10 | 0.75 | 6.90 | 0.94 | 0.94 | 0.21 | 0.03 | 0.01 | 218.7 | 7.0 |
| | Reporting Year 2025 (n=6) | 1.06 | 0.02 | 5.70 | 0.07 | 1.15 | 0.04 | 0.03 | 0.02 | 240.2 | 1.1 |
| S-9 | Production (5/2024- 12/2024) (n=6) | 0.63 | 0.02 | 4.72 | 0.22 | 0.68 | 0.03 | 0.01 | 0.00 | 131.2 | 5.6 |
| | Reporting Year 2025 (n=6) | 3.04 | 0.04 | 7.68 | 0.14 | 0.46 | 0.03 | 0.04 | 0.01 | 226.0 | 4.2 |

Note:

1. Non-detects are averaged using half of the MRL/MDL

4.3. QA/QC Results

ALS Environmental analyzed the required parameters (see Table 1-1) for the bioassay samples. Complete QA plans and reports are kept on file at the ALS Environmental office and are available upon request. This section summarizes the relevant QA/QC results for the sampling completed during the reporting period.

Per the ALS Service Request – K2505631:

No significant anomalies were noted with this analysis.

Replicate samples have been collected from each site, when possible, to address a National Marine Fisheries Service request since 2004. Replicate precision is evaluated using the Relative Standard Deviation (RSD).

$$\text{RSD} = (\text{standard deviation} * 100) / \text{sample mean}$$

The RSDs for the 2025 replicate samples are in Table 4-4.

The data quality objective for the RSD is that it is less than or equal to 30 percent when the values are at least four times the permitted detection limit for the sampled metal.

All RSD percentages calculated for the 2025 reporting period met or exceeded the data quality objective.

Table 4-4: Relative Standard Deviation for Replicate Tissue Samples

| Sample ID | Rep | Date(s) | Cd (mg/kg dw) | Cu (mg/kg dw) | Pb (mg/kg dw) | Hg (mg/kg dw) | Zn (mg/kg dw) |
|----------------|-----|------------|------------------|------------------|------------------|------------------|------------------|
| S-1 Nephtys | 1 | 2025-05-27 | 1.68 | 5.60 | 0.68 | 0.03 | 182.00 |
| | 2 | | 1.69 | 5.59 | 0.67 | 0.03 | 181.00 |
| | 3 | | 1.71 | 5.96 | 0.72 | 0.03 | 187.00 |
| | 4 | | 1.70 | 6.00 | 0.77 | 0.06 | 186.00 |
| | 5 | | 1.69 | 5.64 | 0.67 | 0.03 | 184.00 |
| | 6 | | 1.74 | 5.77 | 0.70 | 0.03 | 185.00 |
| RSD (%) | | | 1.3 | 3.2 | 5.7 | -- | 1.3 |
| S-2 Nephtys | 1 | 2025-05-27 | 1.44 | 7.31 | 0.38 | 0.06 | 173.00 |
| | 2 | | 1.49 | 7.62 | 0.38 | <0.02 | 173.00 |
| | 3 | | 1.47 | 7.65 | 0.41 | <0.02 | 175.00 |
| | 4 | | 1.42 | 7.43 | 0.38 | 0.05 | 169.00 |
| | 5 | | 1.42 | 7.32 | 0.38 | 0.05 | 172.00 |
| | 6 | | 1.42 | 8.03 | 0.37 | 0.03 | 170.00 |
| RSD (%) | | | 2.1 | 3.6 | 3.2 | -- | 1.3 |
| S-3 Nephtys | 1 | 2025-05-31 | 1.49 | 8.49 | 0.52 | 0.05 | 271.00 |
| | 2 | | 1.43 | 8.45 | 0.42 | 0.04 | 262.00 |
| | 3 | | 1.46 | 8.03 | 0.41 | 0.04 | 272.00 |
| | 4 | | 1.46 | 8.29 | 0.42 | 0.02 | 271.00 |
| | 5 | | 1.47 | 8.01 | 0.42 | 0.06 | 266.00 |
| | 6 | | 1.48 | 8.57 | 0.44 | 0.02 | 269.00 |
| RSD (%) | | | 1.42 | 2.9 | 9.15 | -- | 1.4 |
| S-4 Nephtys | 1 | 2025-05-30 | 1.04 | 14.20 | 2.84 | 0.07 | 192.00 |
| | 2 | | 1.04 | 15.20 | 2.80 | 0.05 | 201.00 |
| | 3 | | 1.02 | 13.90 | 2.77 | 0.10 | 194.00 |
| | 4 | | 0.98 | 14.50 | 2.66 | 0.06 | 188.00 |
| | 5 | | 1.00 | 14.10 | 2.74 | 0.07 | 191.00 |
| | 6 | | 1.06 | 14.10 | 2.85 | 0.06 | 199.00 |
| RSD (%) | | | 2.79 | 3.3 | 2.54 | -- | 2.6 |
| S-8 Nephtys | 1 | 2025-05-29 | 1.05 | 5.71 | 1.13 | 0.05 | 239.00 |
| | 2 | | 1.06 | 5.74 | 1.24 | <0.02 | 239.00 |
| | 3 | | 1.06 | 5.71 | 1.13 | 0.06 | 241.00 |
| | 4 | | 1.04 | 5.65 | 1.11 | 0.02 | 240.00 |
| | 5 | | 1.05 | 5.58 | 1.11 | <0.02 | 242.00 |
| | 6 | | 1.09 | 5.80 | 1.15 | 0.04 | 240.00 |
| RSD (%) | | | 1.63 | 1.3 | 4.27 | -- | 0.5 |
| S-9 Nephtys | 1 | 2025-05-29 | 2.99 | 7.63 | 0.52 | 0.04 | 225.00 |
| | 2 | | 3.01 | 7.69 | 0.46 | 0.05 | 224.00 |
| | 3 | | 3.11 | 7.74 | 0.50 | 0.06 | 235.00 |
| | 4 | | 3.06 | 7.40 | 0.44 | 0.04 | 223.00 |
| | 5 | | 3.00 | 7.77 | 0.43 | 0.03 | 223.00 |
| | 6 | | 3.05 | 7.84 | 0.45 | 0.06 | 226.00 |
| RSD (%) | | | 1.50 | 2.0 | 7.68 | -- | 2.0 |

Notes:

1. A '--' indicates RSD was not calculated because three or more of the values was less than 4 times the MRL.
2. A '<' denotes the sample was analyzed for but was not detected above the MRL/MDL.

Table 4-4 Continued: Relative Standard Deviation for Replicate Tissue Samples

| Sample ID | Rep | Date(s) | Cd (mg/kg dw) | Cu (mg/kg dw) | Pb (mg/kg dw) | Hg (mg/kg dw) | Zn (mg/kg dw) |
|----------------|-----|------------|------------------|------------------|------------------|------------------|------------------|
| ESL Mussels | 1 | 2025-05-28 | 7.90 | 8.74 | 0.52 | 0.03 | 110.00 |
| | 2 | 2025-05-29 | 7.94 | 8.77 | 0.53 | 0.03 | 112.00 |
| | 3 | 2025-05-28 | 7.71 | 8.46 | 0.50 | 0.04 | 106.00 |
| | 4 | 2025-05-28 | 7.93 | 8.72 | 0.52 | 0.04 | 110.00 |
| | 5 | 2025-05-28 | 7.81 | 8.49 | 0.54 | 0.03 | 107.00 |
| | 6 | 2025-05-28 | 7.71 | 8.49 | 0.50 | 0.04 | 108.00 |
| RSD (%) | | | 1.4 | 1.7 | 2.8 | -- | 2.0 |
| STN-1 Mussels | 1 | 2025-05-29 | 12.20 | 7.00 | 0.83 | 0.05 | 113.00 |
| | 2 | 2025-05-29 | 12.20 | 7.40 | 0.84 | 0.04 | 118.00 |
| | 3 | 2025-05-28 | 12.00 | 7.19 | 0.96 | 0.05 | 111.00 |
| | 4 | 2025-05-28 | 11.70 | 6.73 | 0.83 | 0.05 | 110.00 |
| | 5 | 2025-05-28 | 12.40 | 7.17 | 0.87 | 0.04 | 114.00 |
| | 6 | 2025-05-28 | 12.20 | 6.89 | 0.83 | 0.04 | 112.00 |
| RSD (%) | | | 2.0 | 3.4 | 6.0 | -- | 2.5 |
| STN-2 Mussels | 1 | 2025-05-28 | 13.20 | 7.95 | 0.61 | 0.05 | 107.00 |
| | 2 | 2025-05-29 | 12.70 | 7.76 | 0.63 | 0.05 | 101.00 |
| | 3 | 2025-05-28 | 13.20 | 8.19 | 0.64 | 0.05 | 107.00 |
| | 4 | 2025-05-29 | 12.90 | 7.91 | 0.67 | 0.05 | 106.00 |
| | 5 | 2025-05-28 | 13.10 | 7.91 | 0.62 | 0.05 | 106.00 |
| | 6 | 2025-05-28 | 13.30 | 7.96 | 0.58 | 0.05 | 107.00 |
| RSD (%) | | | 1.72 | 1.8 | 4.85 | -- | 2.2 |
| STN-3 Mussels | 1 | 2025-05-28 | 13.20 | 7.01 | 0.64 | 0.04 | 107.00 |
| | 2 | 2025-05-29 | 13.20 | 6.97 | 0.72 | 0.05 | 105.00 |
| | 3 | 2025-05-28 | 13.90 | 7.29 | 0.58 | 0.05 | 110.00 |
| | 4 | 2025-05-29 | 13.20 | 7.08 | 0.63 | 0.05 | 106.00 |
| | 5 | 2025-05-28 | 13.30 | 7.06 | 0.66 | 0.05 | 106.00 |
| | 6 | 2025-05-29 | 13.40 | 7.20 | 0.75 | 0.05 | 108.00 |
| RSD (%) | | | 2.04 | 1.7 | 9.4 | -- | 1.7 |
| STN-5 Mussels | 1 | 2025-05-29 | 7.88 | 7.95 | 0.87 | 0.05 | 107.00 |
| | 2 | 2025-05-28 | 7.68 | 7.98 | 0.88 | 0.05 | 109.00 |
| | 3 | 2025-05-29 | 8.11 | 8.21 | 0.93 | 0.04 | 112.00 |
| | 4 | 2025-05-29 | 8.17 | 8.19 | 1.10 | 0.05 | 113.00 |
| | 5 | 2025-05-29 | 8.00 | 8.15 | 0.92 | 0.05 | 109.00 |
| | 6 | 2025-05-28 | 7.98 | 8.13 | 0.87 | 0.05 | 111.00 |
| RSD (%) | | | 2.19 | 1.4 | 9.4 | -- | 2.0 |
| STN-6 Mussels | 1 | 2025-05-28 | 8.59 | 7.89 | 0.75 | 0.05 | 115.00 |
| | 2 | 2025-05-28 | 8.57 | 8.22 | 0.76 | 0.05 | 114.00 |
| | 3 | 2025-05-28 | 9.30 | 8.14 | 0.81 | 0.06 | 119.00 |
| | 4 | 2025-05-28 | 8.68 | 8.05 | 0.88 | 0.06 | 116.00 |
| | 5 | 2025-05-28 | 8.73 | 8.12 | 0.78 | 0.06 | 117.00 |
| | 6 | 2025-05-29 | 8.54 | 7.95 | 0.78 | 0.05 | 113.00 |
| RSD (%) | | | 3.27 | 1.5 | 5.9 | -- | 1.9 |

Notes:

1. A '--' indicates RSD was not calculated because three or more of the values are less than 4 times the MRL.
2. A '<' denotes the sample was analyzed for but was not detected above the MRL/MDL.

5. REFERENCES

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Slotta Engineering Associates, Inc. (SEA). (1983). *1983 Environmental Studies Greens Creek Mining Joint Venture: Hawk Inlet*.

6. FIGURES

Figure 1-1: Hawk Inlet Outfall & Monitoring Locations



Figure 2-1a. Site 106 - Field pH

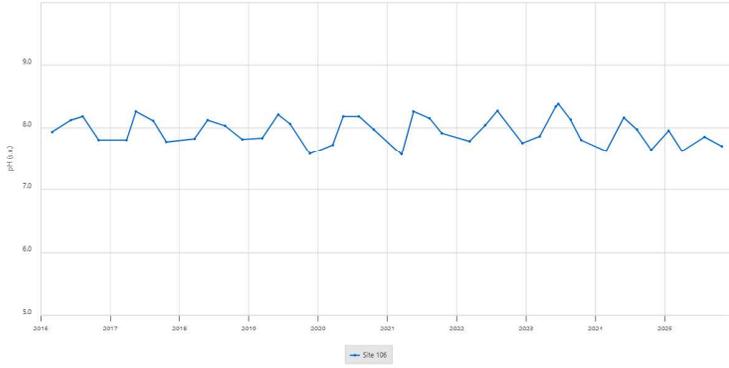


Figure 2-1b. Site 107 - Field pH

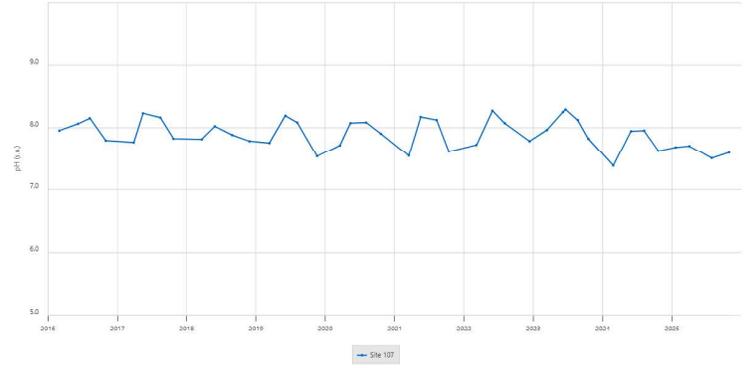


Figure 2-1c. Site 108 - Field pH

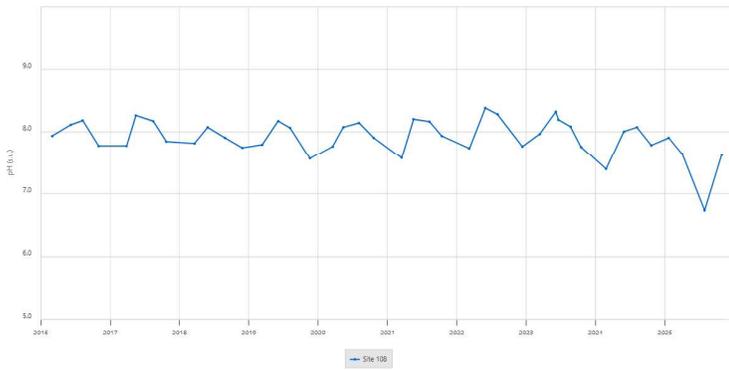


Figure 2-2a. Site 106 - Field Conductivity

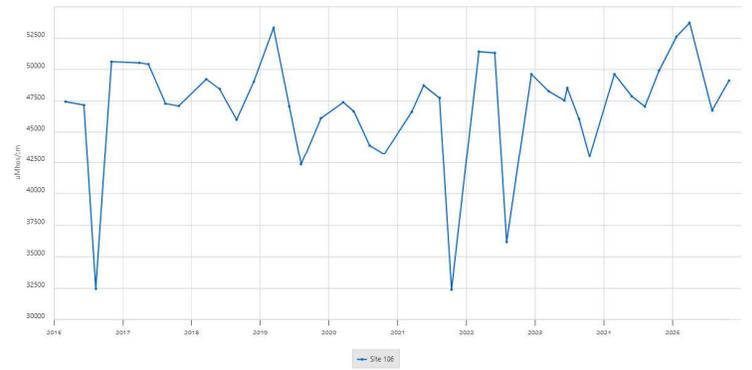


Figure 2-2b. Site 107 - Field Conductivity

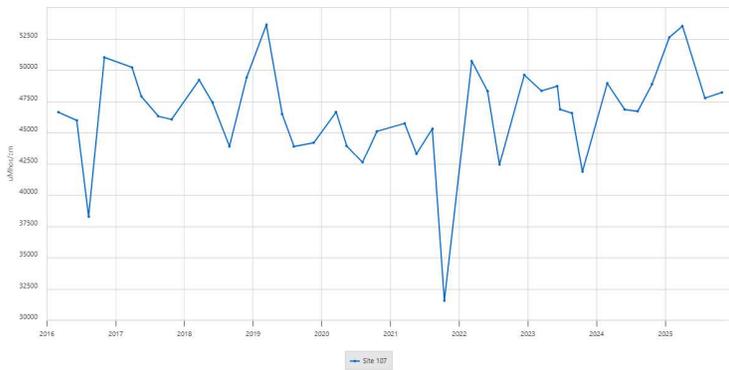


Figure 2-2c. Site 108 - Field Conductivity

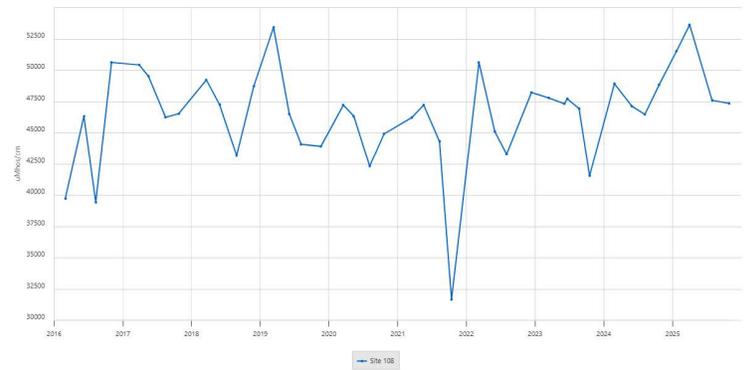


Figure 2-3a. Site 106 - Cadmium

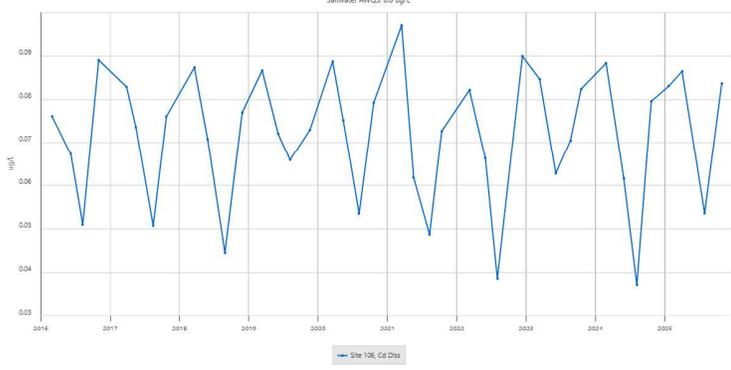


Figure 2-3b. Site 107 - Cadmium

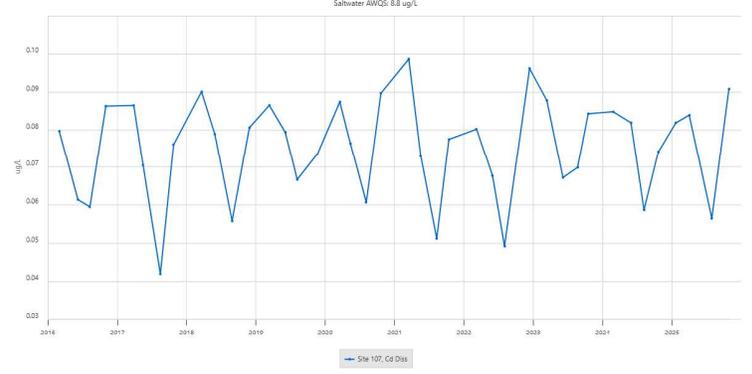


Figure 2-3c. Site 108 - Cadmium

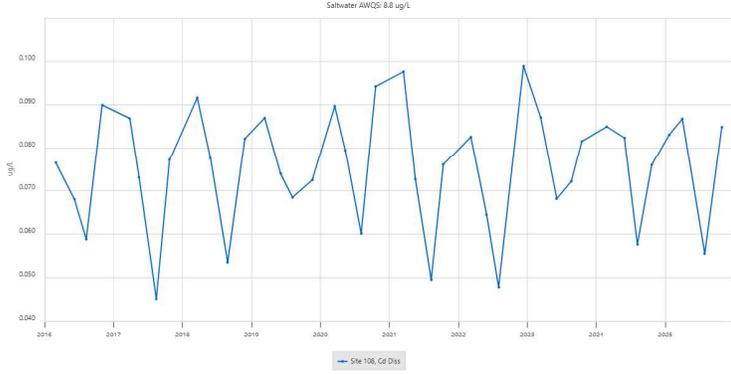


Figure 2-4a. Site 106 - Copper

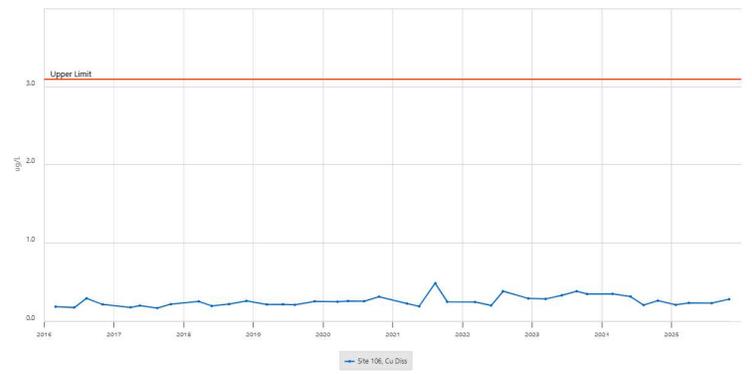


Figure 2-4b. Site 107 - Copper

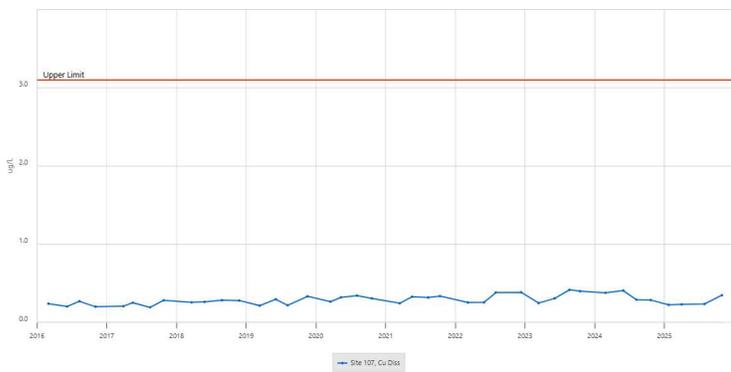


Figure 2-4c. Site 108 - Copper

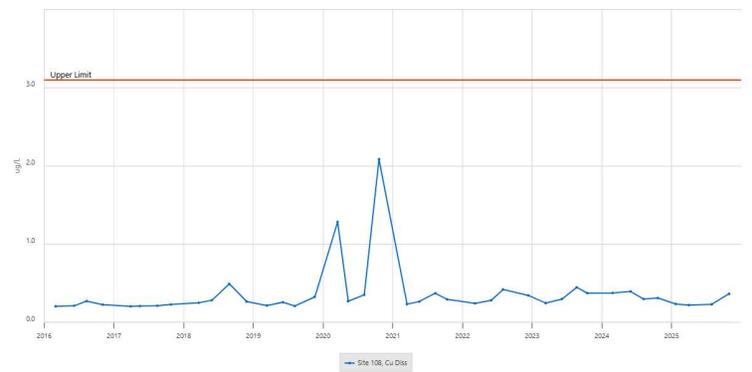


Figure 2-5a. Site 106 - Mercury

Saltwater AWCQ: 0.94 ug/L

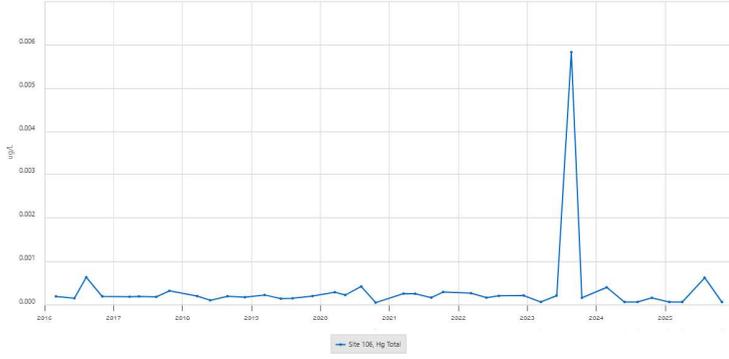


Figure 2-5b. Site 107 - Mercury

Saltwater AWCQ: 0.94 ug/L

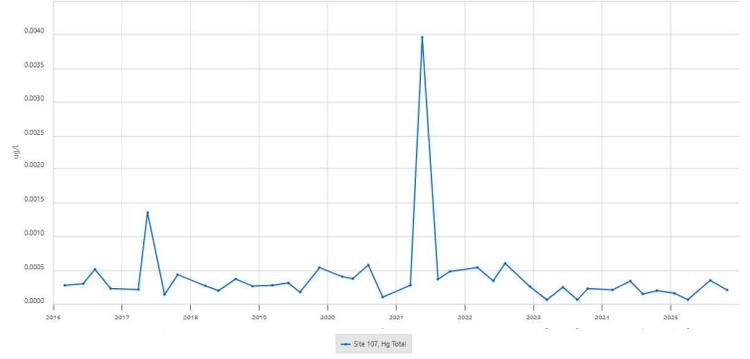


Figure 2-5c. Site 108 - Mercury

Saltwater AWCQ: 0.94 ug/L

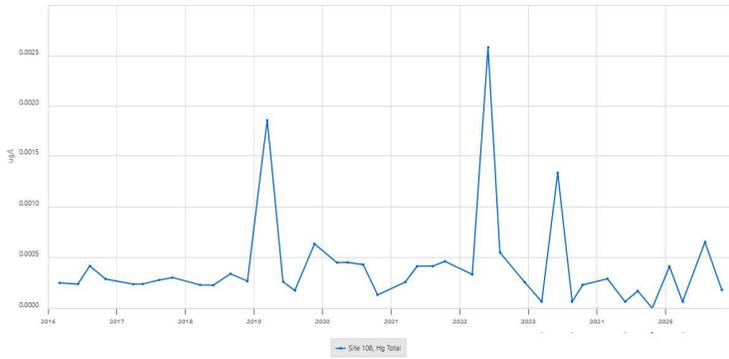


Figure 2-6a. Site 106 - Lead

Saltwater AWCQ: 8.05 ug/L

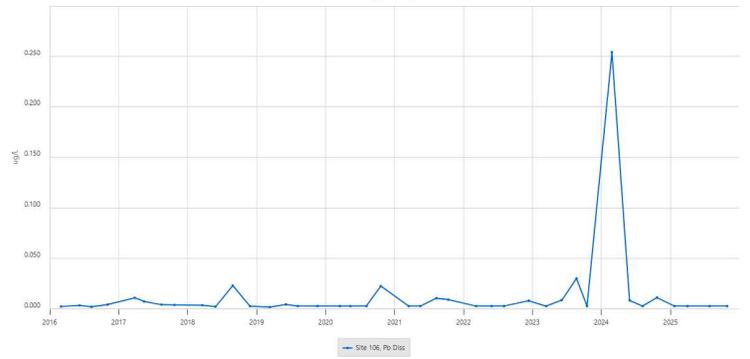


Figure 2-6b. Site 107 - Lead

Saltwater AWCQ: 8.05 ug/L

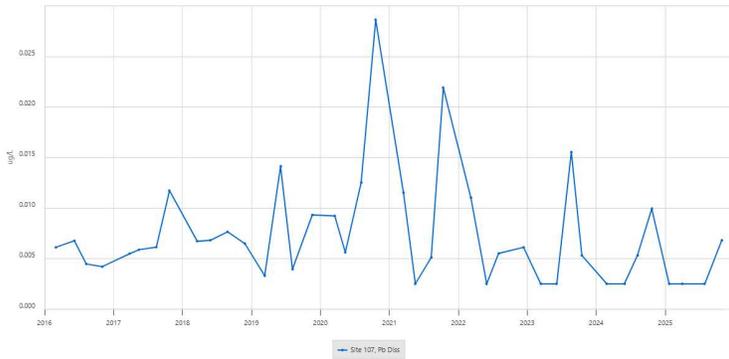


Figure 2-6c. Site 108 - Lead

Saltwater AWCQ: 8.05 ug/L

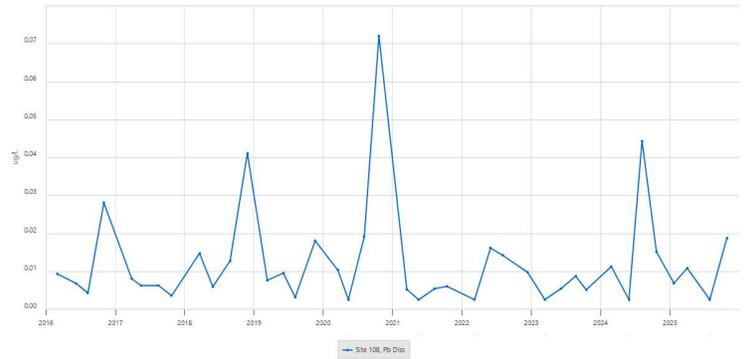


Figure 2-7a. Site 106 - Zn

Saltwater AWC6: 81.5 ug/L

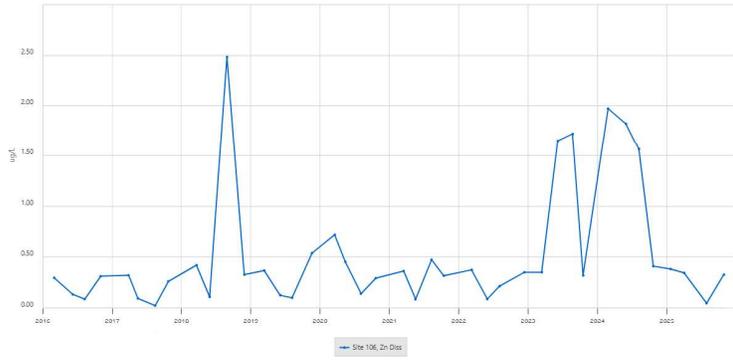


Figure 2-7b. Site 107 - Zn

Saltwater AWC6: 81.5 ug/L

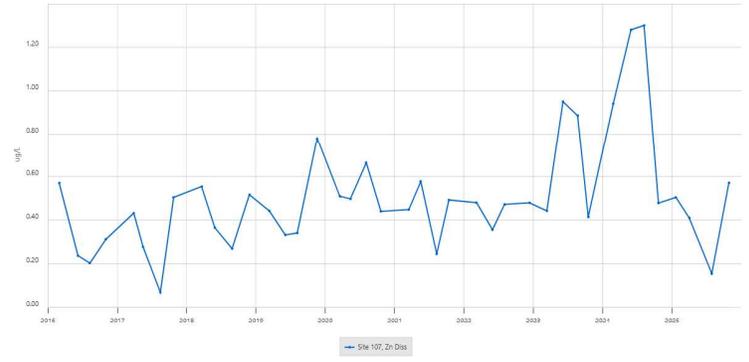


Figure 2-7c. Site 108 - Zn

Saltwater AWC6: 81.5 ug/L

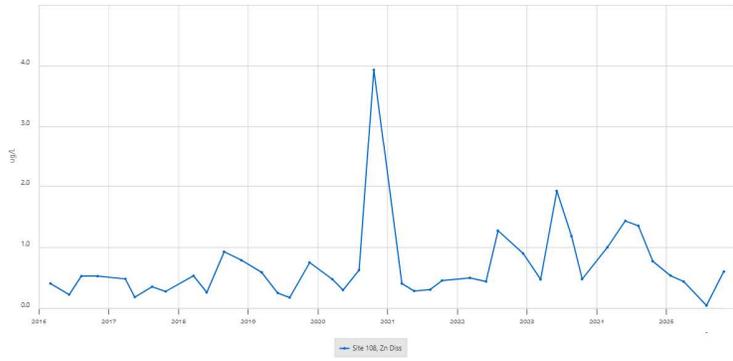


Figure 2-8a. Site 108 and Outfall 002 - Cadmium
 Outfall 002 Daily Max Limit: 16 ug/L - Saltwater AWCQS: 8.8 ug/L

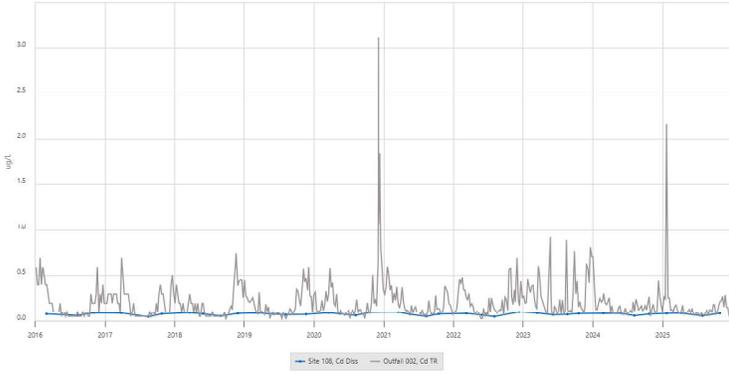


Figure 2-8b. Site 108 and Outfall 002 - Copper
 Outfall 002 Daily Max Limit: 32 ug/L - Saltwater AWCQS: 3.1 ug/L

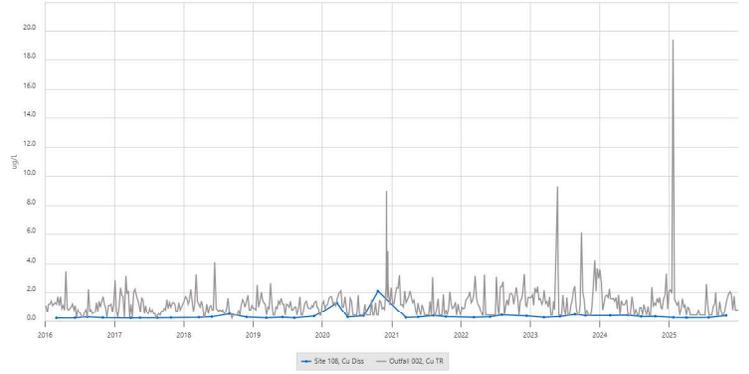


Figure 2-8c. Site 108 and Outfall 002 - Mercury
 Outfall 002 Daily Max Limit: 0.9 ug/L - Saltwater AWCQS: 0.94 ug/L

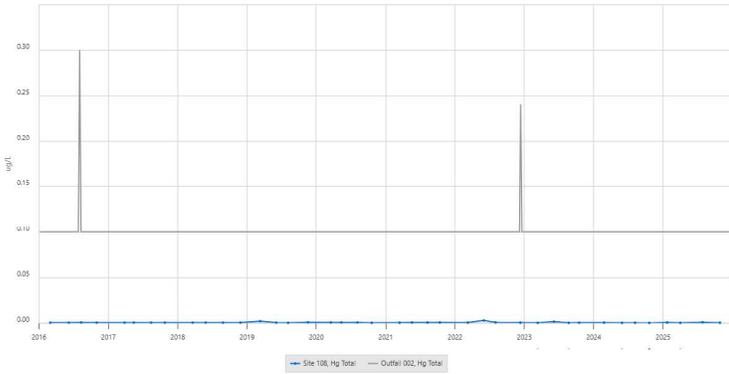


Figure 2-8d. Site 108 and Outfall 002 - Lead
 Outfall 002 Daily Max Limit: 196 ug/L - Saltwater AWCQS: 8.1 ug/L

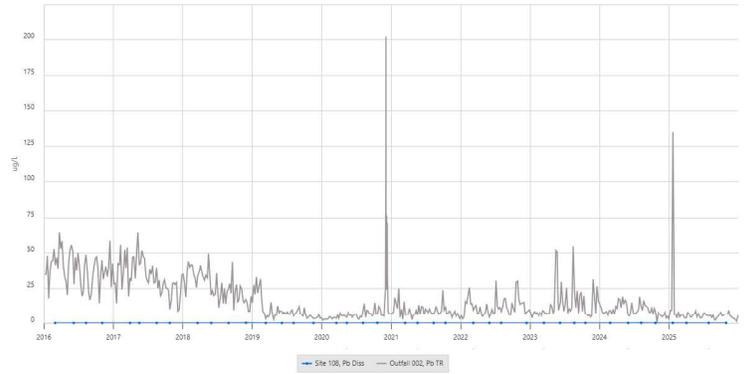


Figure 2-8e. Site 108 and Outfall 002 - Field pH
 Outfall 002 Permitted Range 6.0 to 9.0 s.u. - Saltwater AWCQS Range 6.5 to 8.5 s.u.

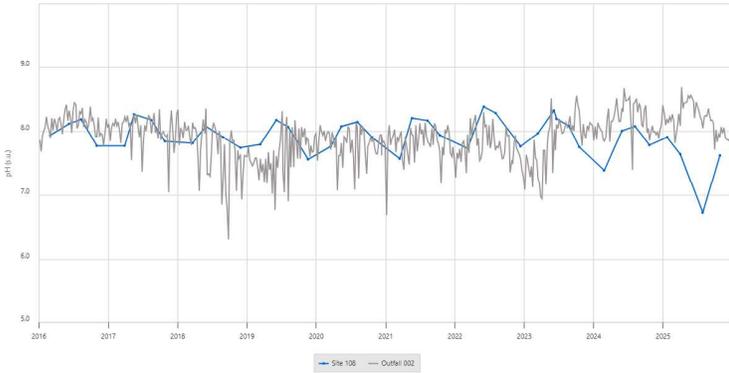


Figure 2-8f. Site 108 and Outfall 002 - Zn
 Outfall 002 Daily Max Limit: 514 ug/L - Saltwater AWCQS: 81 ug/L

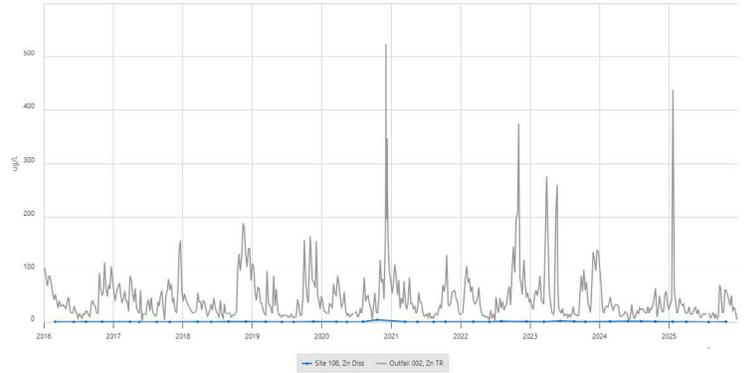


Figure 3-1. Cadmium in Sediment at Site S-1

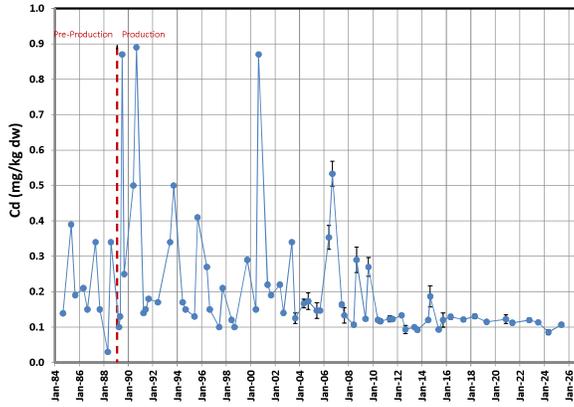


Figure 3-2. Copper in Sediment at Site S-1

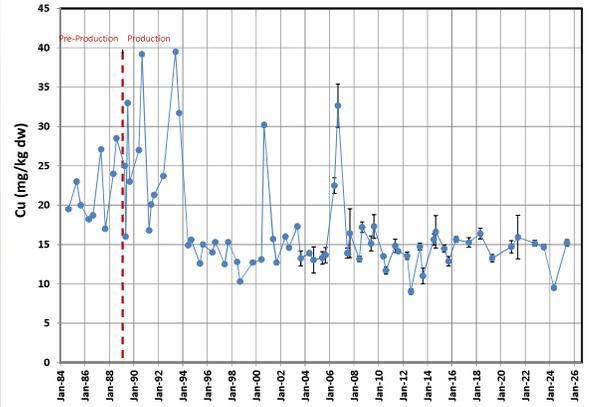


Figure 3-3. Lead in Sediment at Site S-1

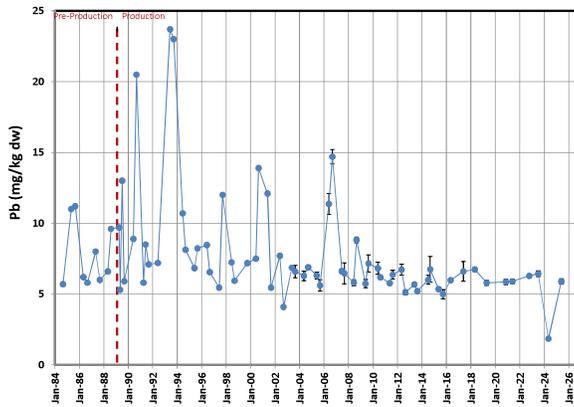


Figure 3-4. Mercury in Sediment at Site S-1

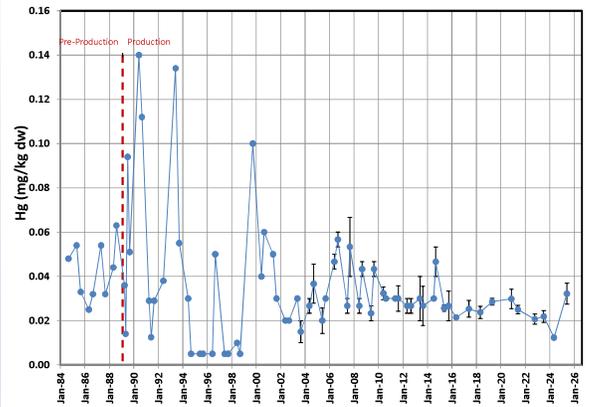


Figure 3-5. Zinc in Sediment at Site S-1

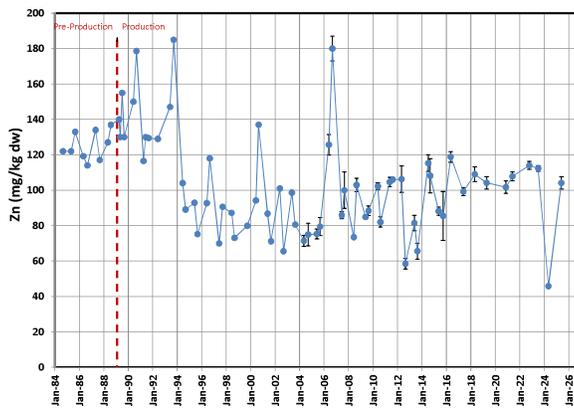


Figure 3-6. Cadmium in Sediment at Site S-2

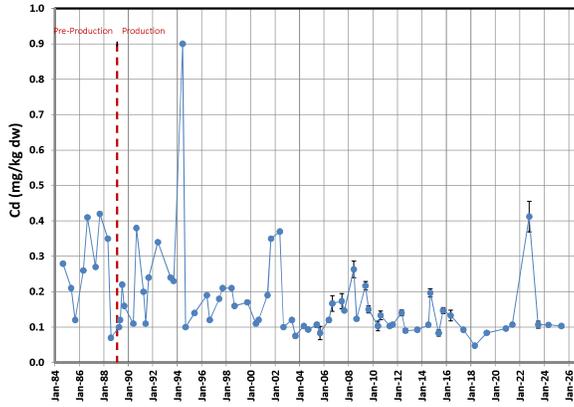


Figure 3-7. Copper in Sediment at Site S-2

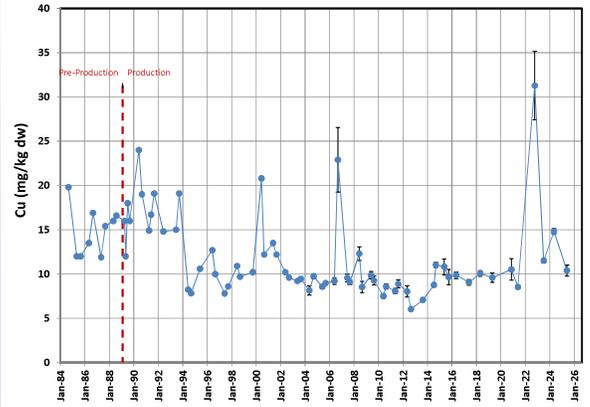


Figure 3-8. Lead in Sediment at Site S-2

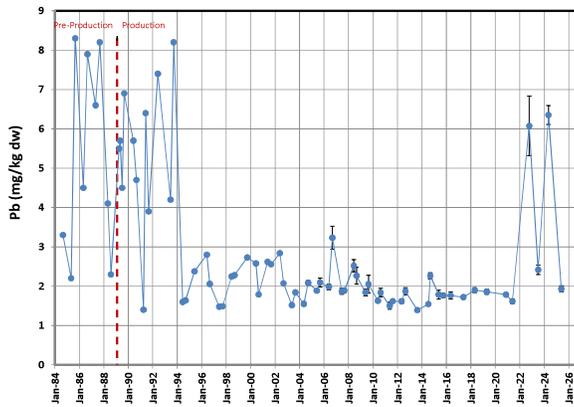


Figure 3-9. Mercury in Sediment at Site S-2

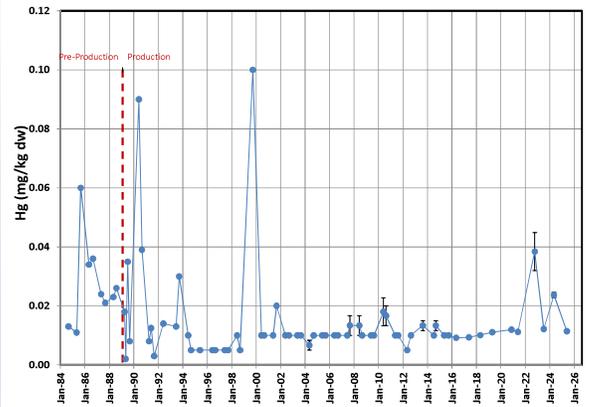


Figure 3-10. Zinc in Sediment at Site S-2

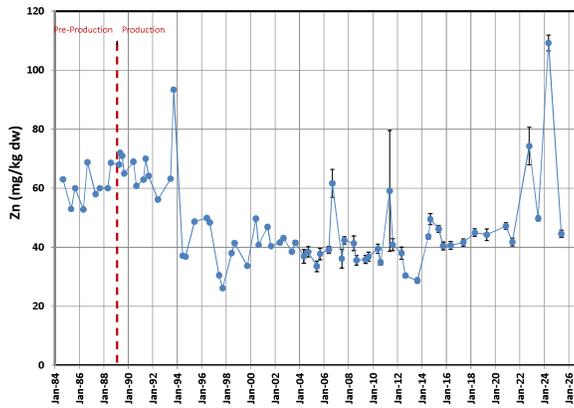


Figure 3-11. Cadmium in Sediment at Site S-3

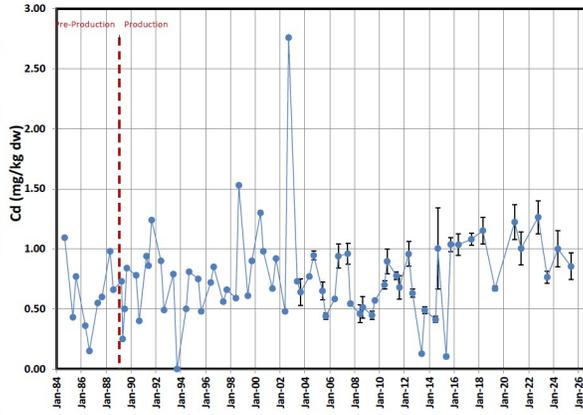


Figure 3-12. Copper in Sediment at Site S-3

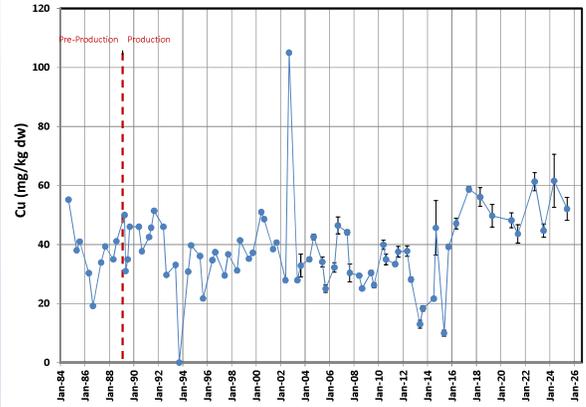


Figure 3-13. Lead in Sediment at Site S-3

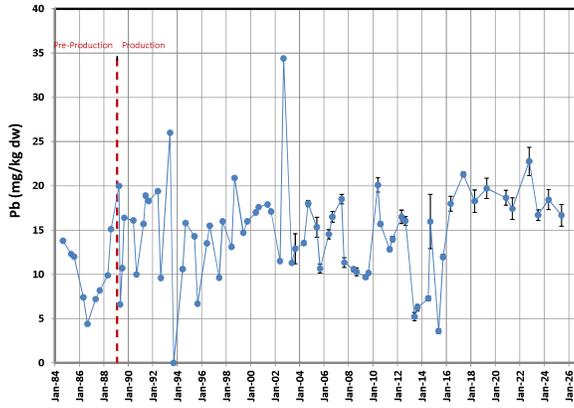


Figure 3-14. Mercury in Sediment at Site S-3

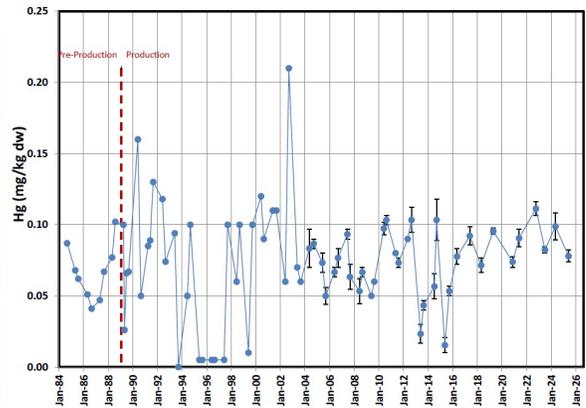


Figure 3-15. Zinc in Sediment at Site S-3

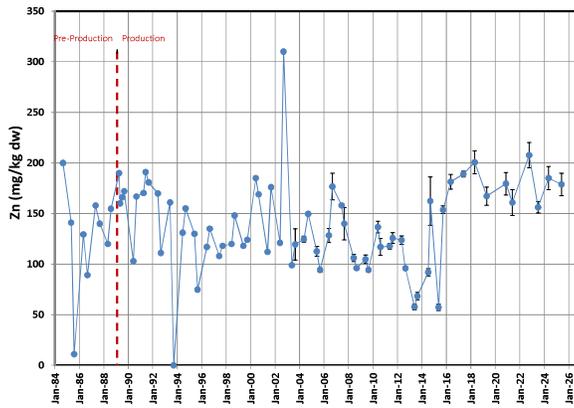


Figure 3-16. Cadmium in Sediment at Site S-4

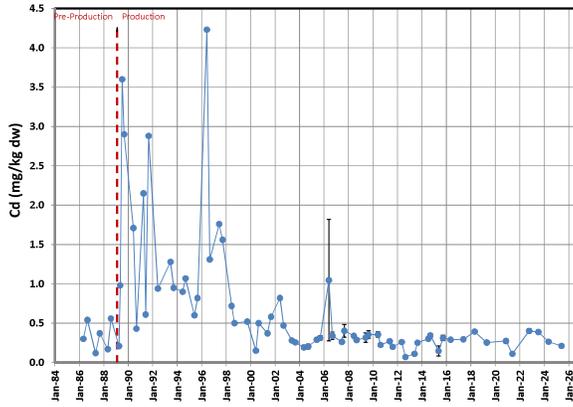


Figure 3-17. Copper in Sediment at Site S-4

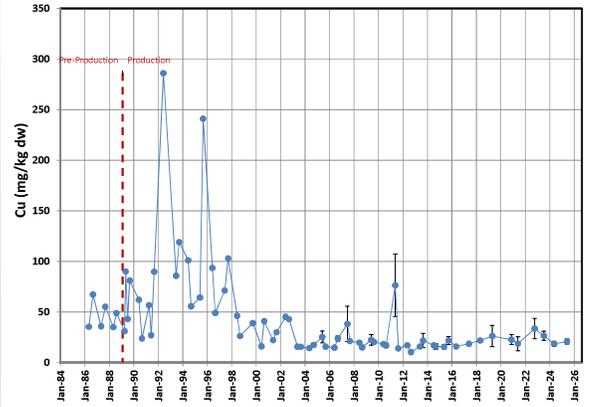


Figure 3-18. Lead in Sediment at Site S-4

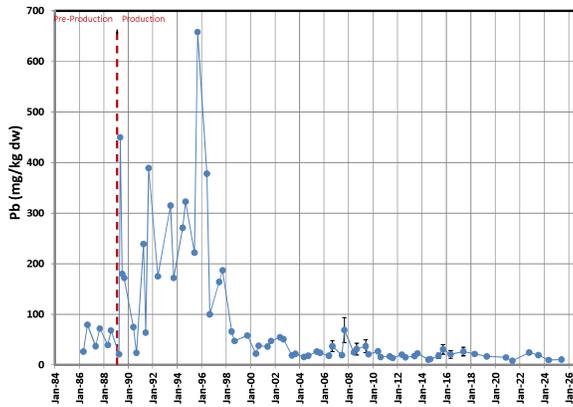


Figure 3-19. Mercury in Sediment at Site S-4

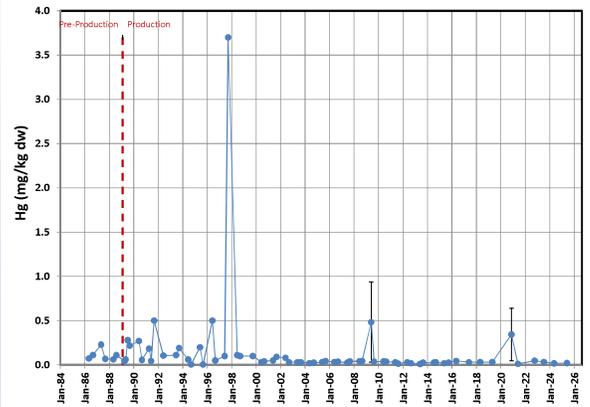


Figure 3-20. Zinc in Sediment at Site S-4

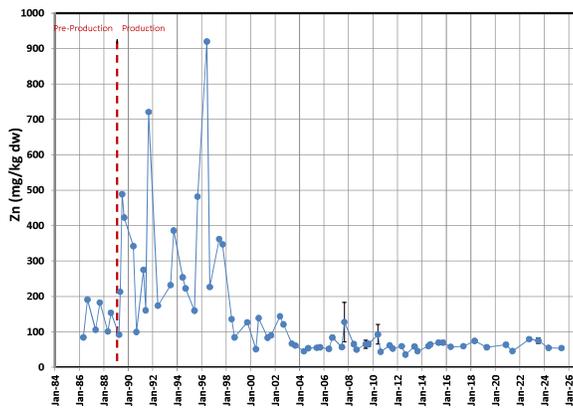


Figure 3-21. Cadmium in Sediment at Site S-7

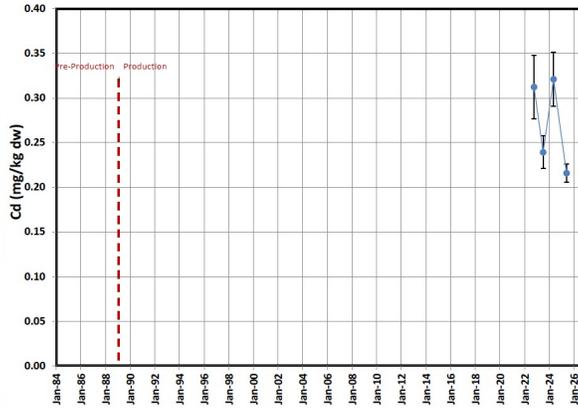


Figure 3-22. Copper in Sediment at Site S-7

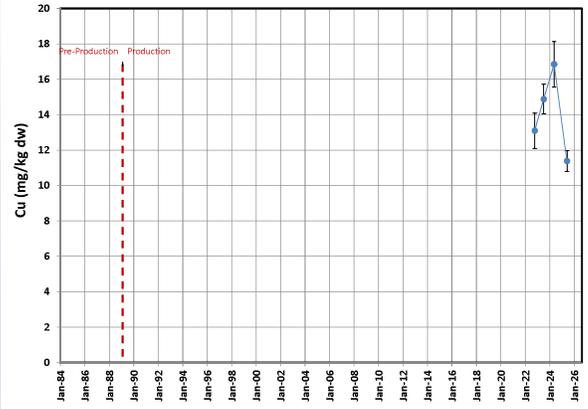


Figure 3-23. Lead in Sediment at Site S-7

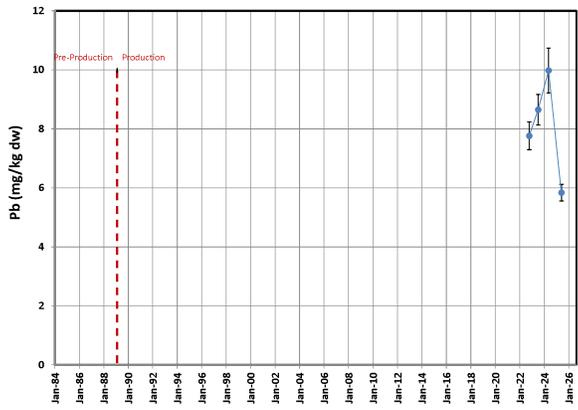


Figure 3-24. Mercury in Sediment at Site S-7

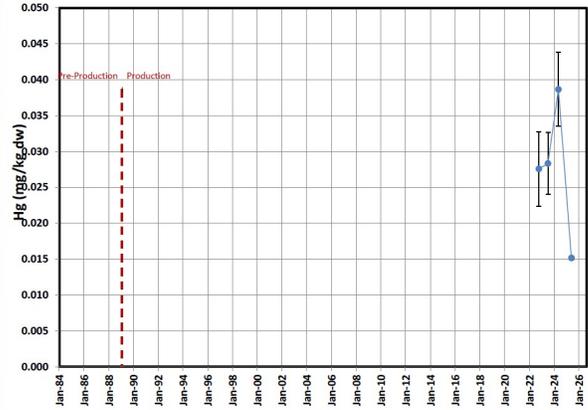


Figure 3-25. Zinc in Sediment at Site S-7

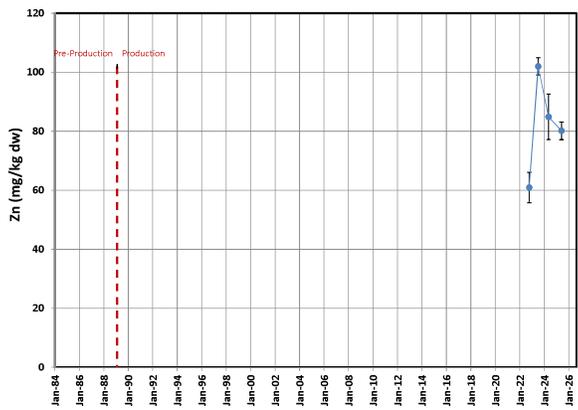


Figure 3-26. Cadmium in Sediment at Site S-8

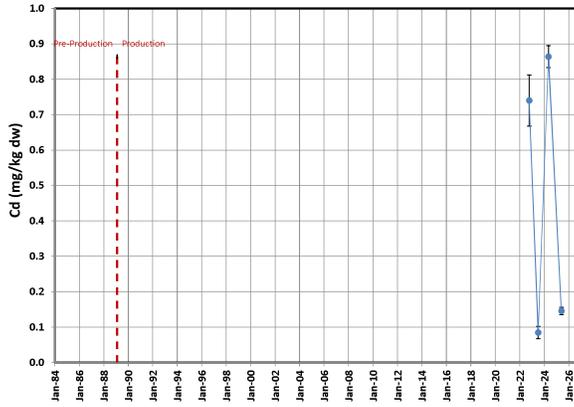


Figure 3-27. Copper in Sediment at Site S-8

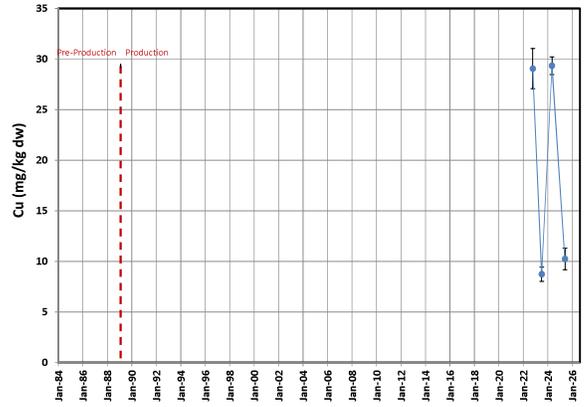


Figure 3-28. Lead in Sediment at Site S-8

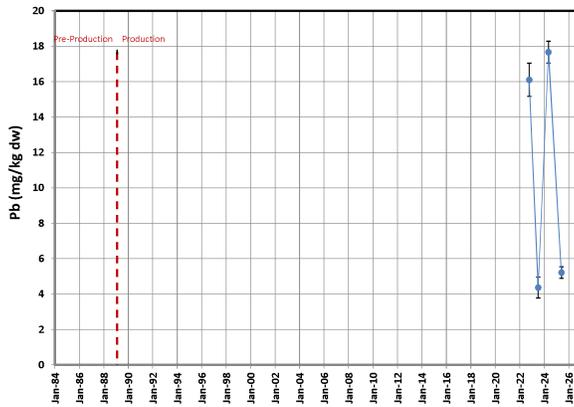


Figure 3-29. Mercury in Sediment at Site S-8

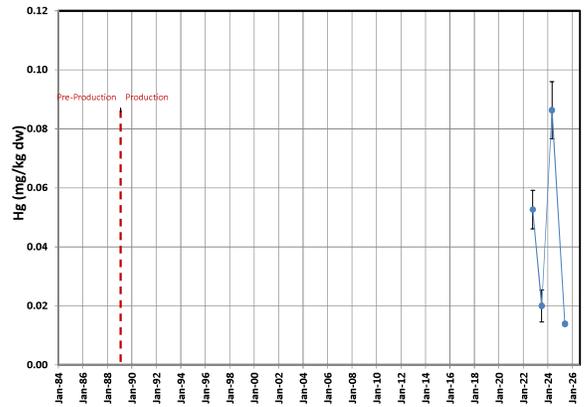


Figure 3-30. Zinc in Sediment at Site S-8

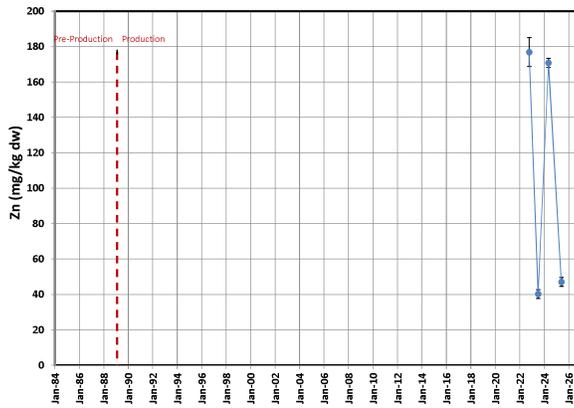


Figure 3-31. Cadmium in Sediment at Site S-9

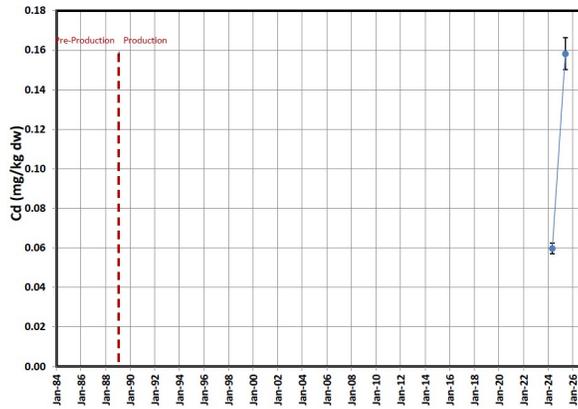


Figure 3-32. Copper in Sediment at Site S-9

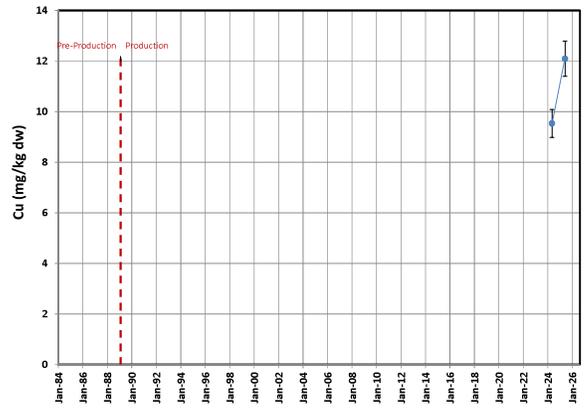


Figure 3-33. Lead in Sediment at Site S-9

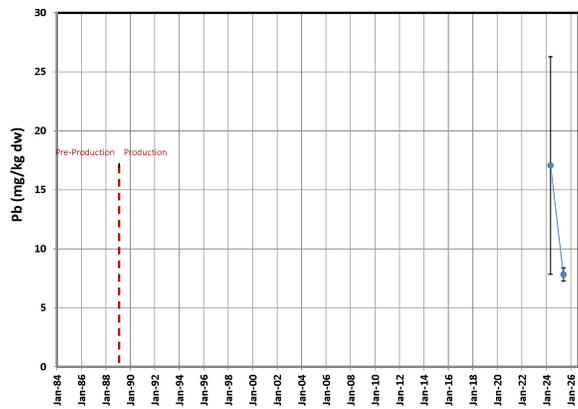


Figure 3-34. Mercury in Sediment at Site S-9

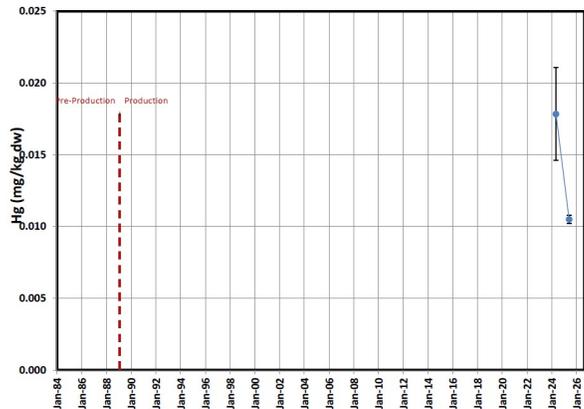


Figure 3-35. Zinc in Sediment at Site S-9

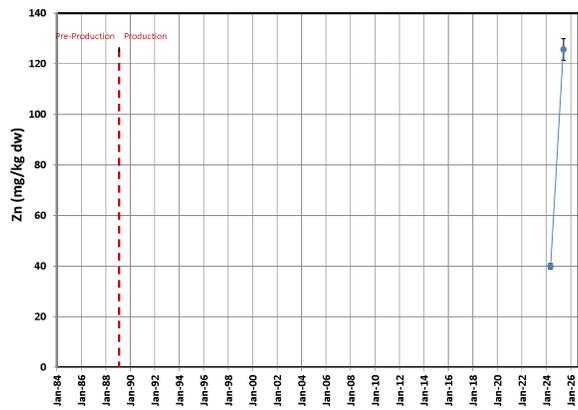


Figure 4-1. Cadmium in Mussels at Site STN-1

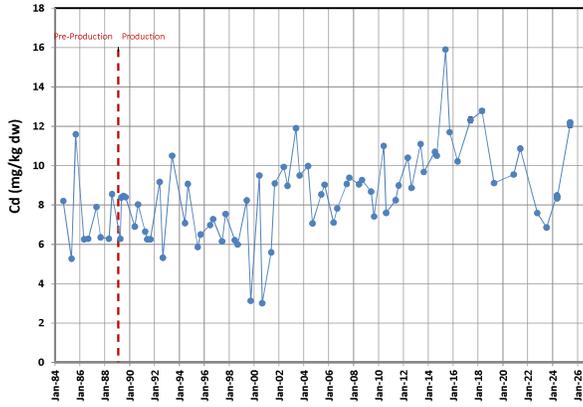


Figure 4-2. Copper in Mussels at Site STN-1

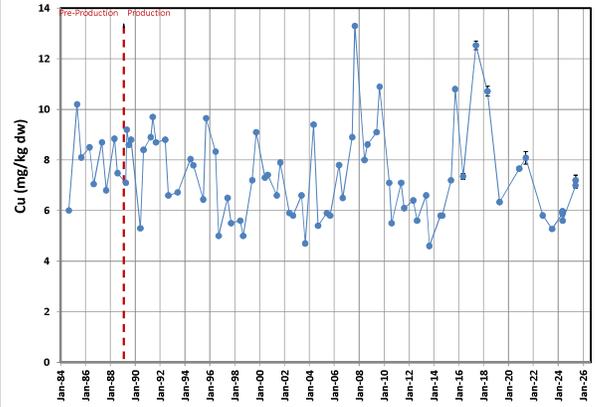


Figure 4-3. Lead in Mussels at Site STN-1

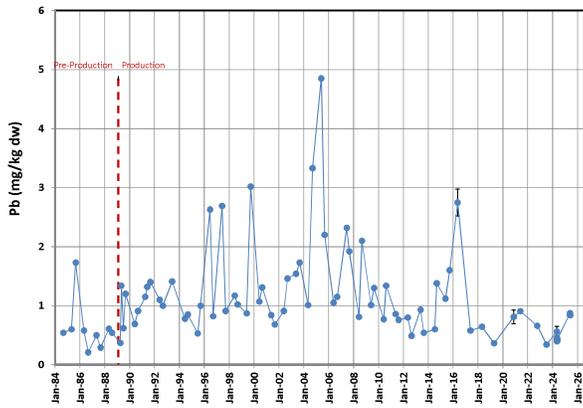


Figure 4-4. Mercury in Mussels at Site STN-1

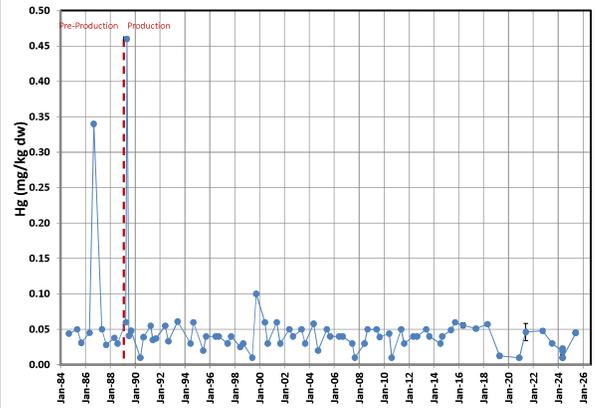


Figure 4-5. Zinc in Mussels at Site STN-1

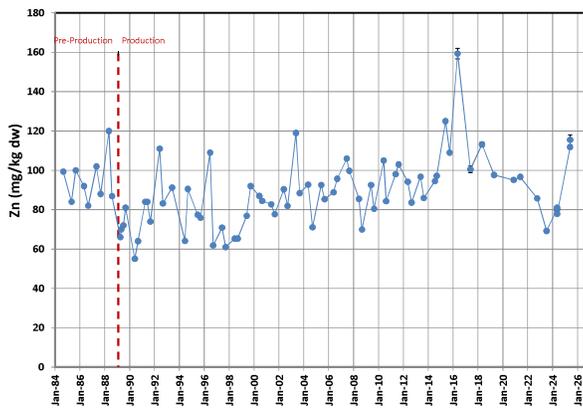


Figure 4-6. Cadmium in Mussels at Site STN-2

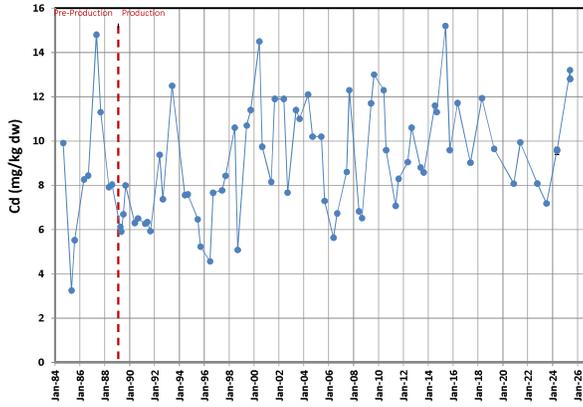


Figure 4-7. Copper in Mussels at Site STN-2

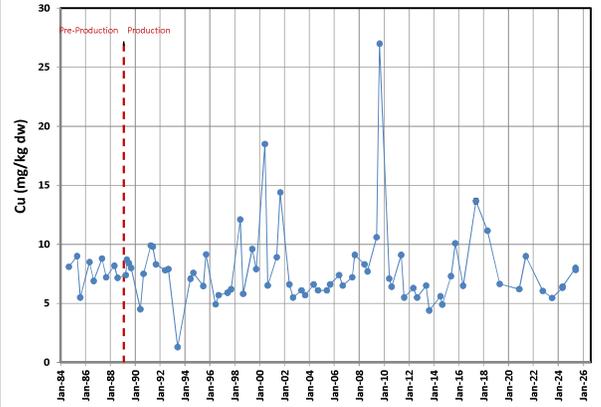


Figure 4-8. Lead in Mussels at Site STN-2

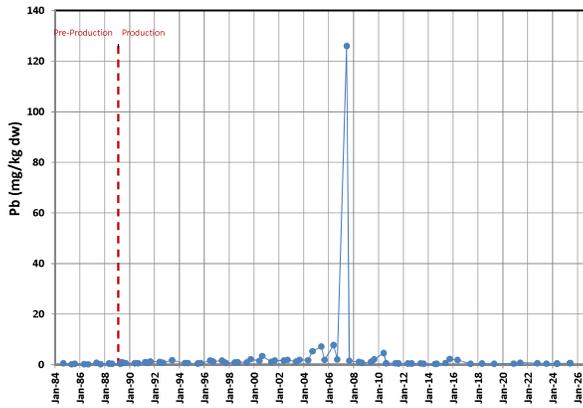


Figure 4-9. Mercury in Mussels at Site STN-2

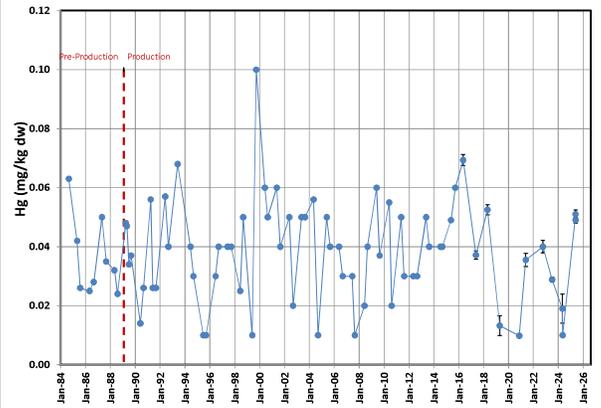


Figure 4-10. Zinc in Mussels at Site STN-2

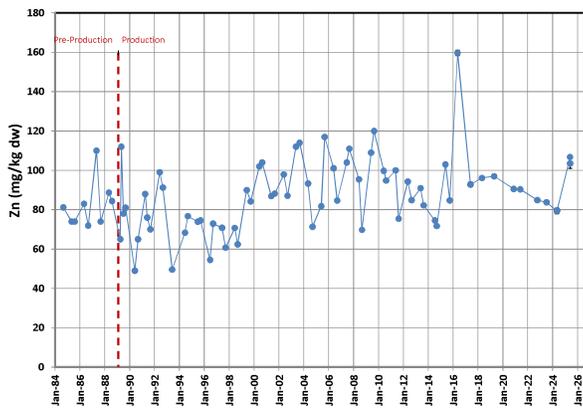


Figure 4-11. Cadmium in Mussels at Site STN-3

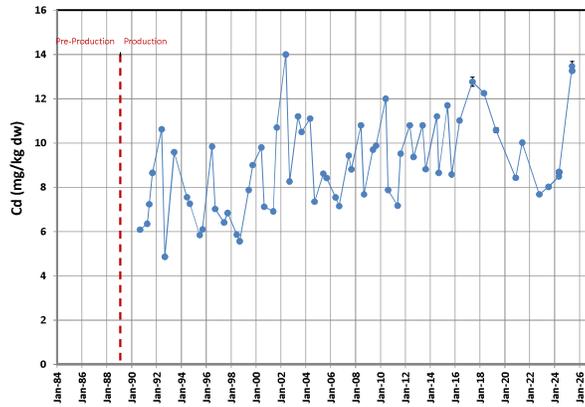


Figure 4-12. Copper in Mussels at Site STN-3

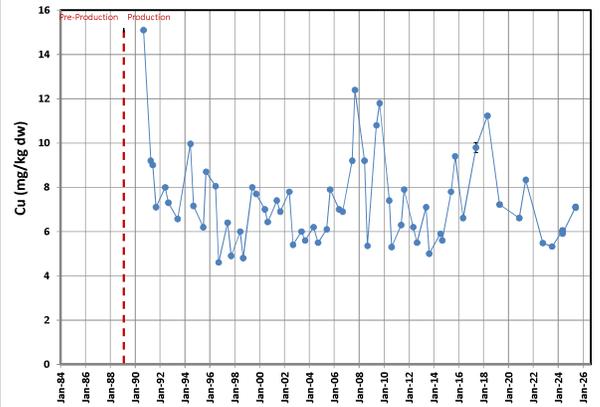


Figure 4-13. Lead in Mussels at Site STN-3

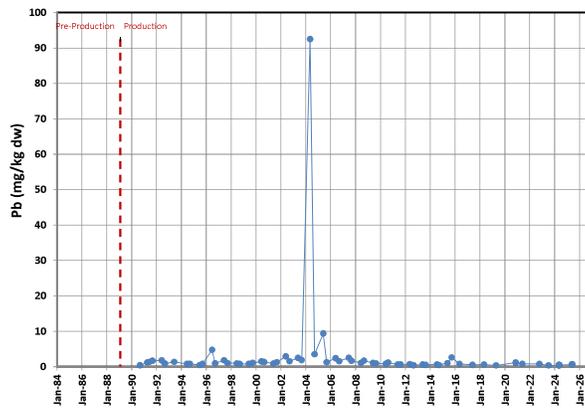


Figure 4-14. Mercury in Mussels at Site STN-3

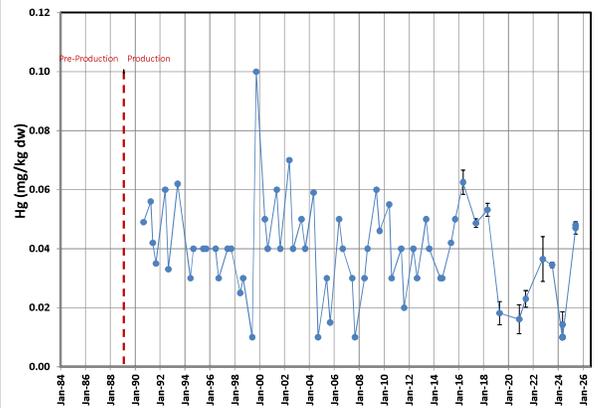


Figure 4-15. Zinc in Mussels at Site STN-3

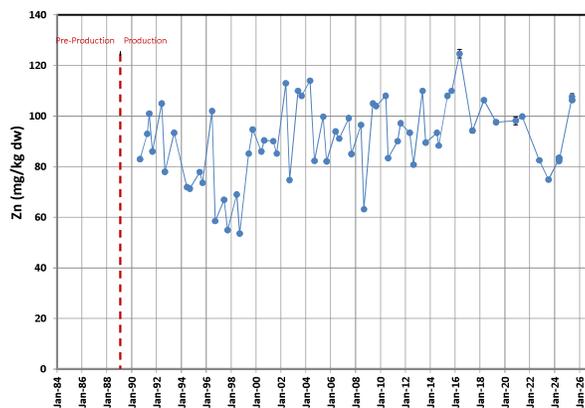


Figure 4-16. Cadmium in Mussels at Site ESL

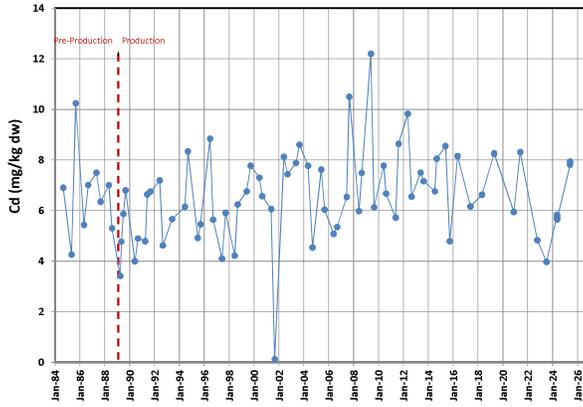


Figure 4-17. Copper in Mussels at Site ESL

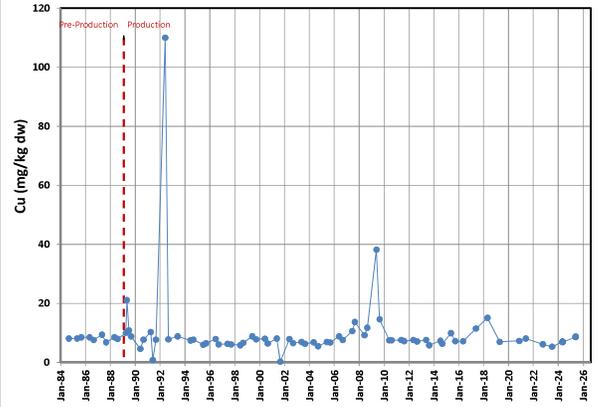


Figure 4-18. Lead in Mussels at Site ESL

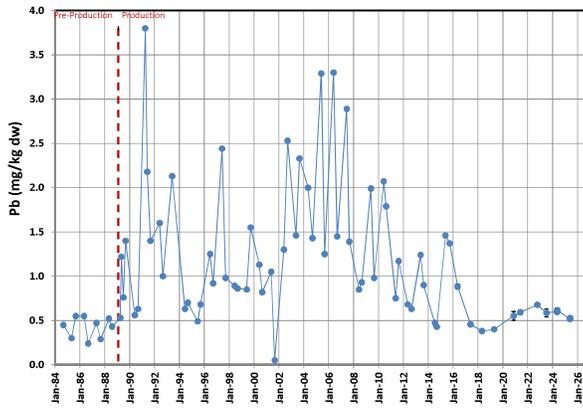


Figure 4-19. Mercury in Mussels at Site ESL

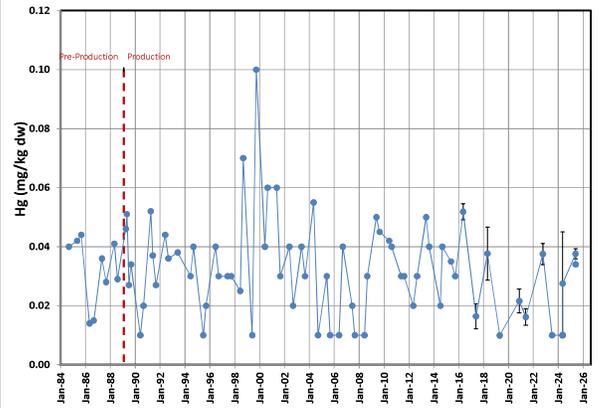


Figure 4-20. Zinc in Mussels at Site ESL

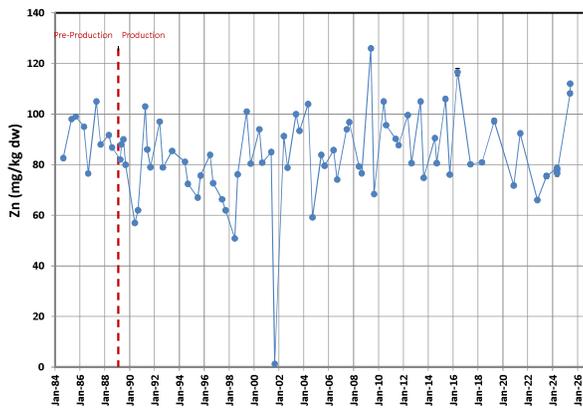


Figure 4-21. Cadmium in Mussels at Site STN-5

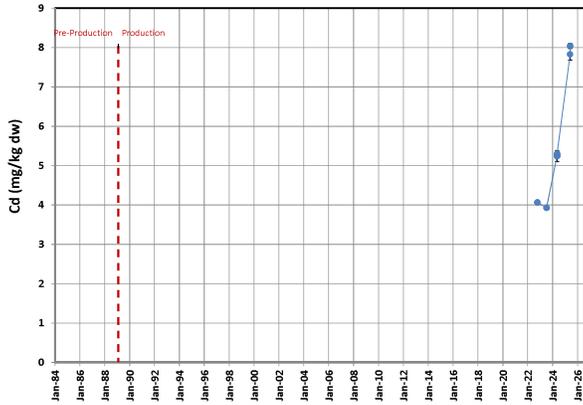


Figure 4-22. Copper in Mussels at Site STN-5

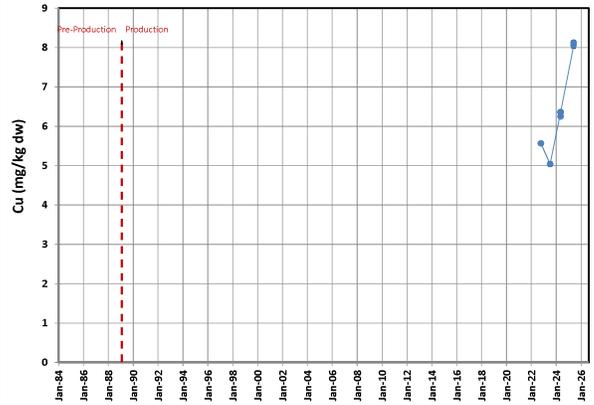


Figure 4-23. Lead in Mussels at Site STN-5

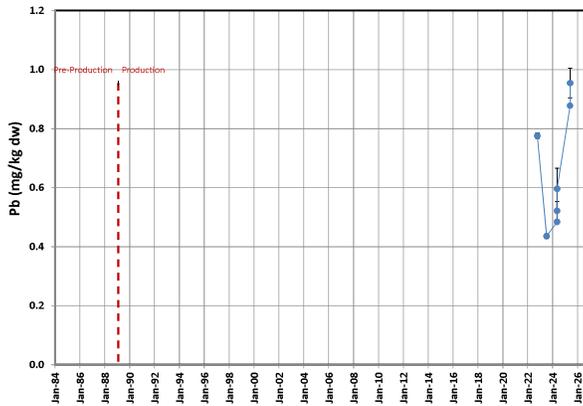


Figure 4-24. Mercury in Mussels at Site STN-5

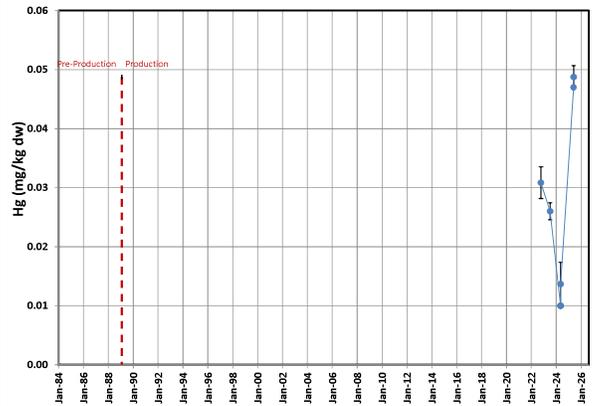


Figure 4-25. Zinc in Mussels at Site STN-5

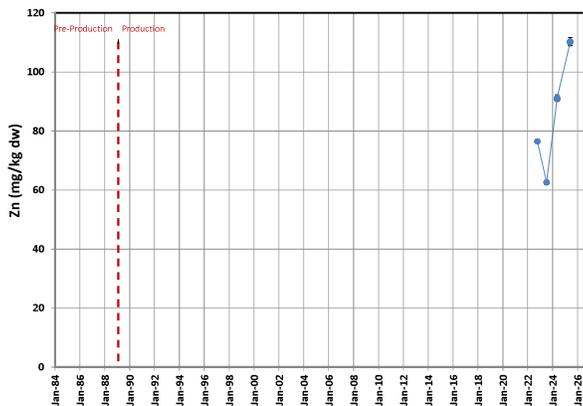


Figure 4-26. Cadmium in Mussels at Site STN-6

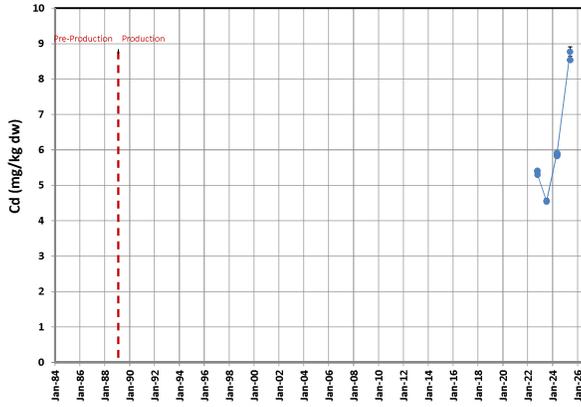


Figure 4-27. Copper in Mussels at Site STN-6

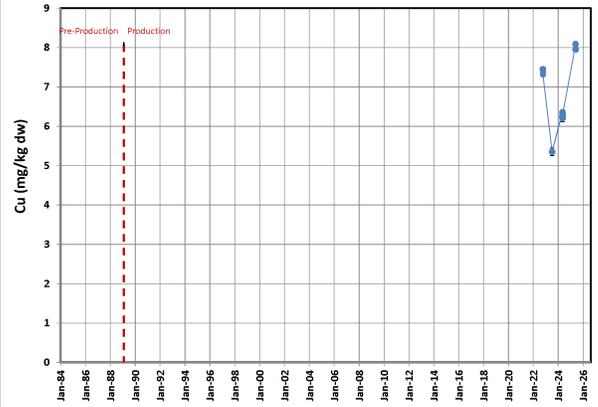


Figure 4-28. Lead in Mussels at Site STN-6

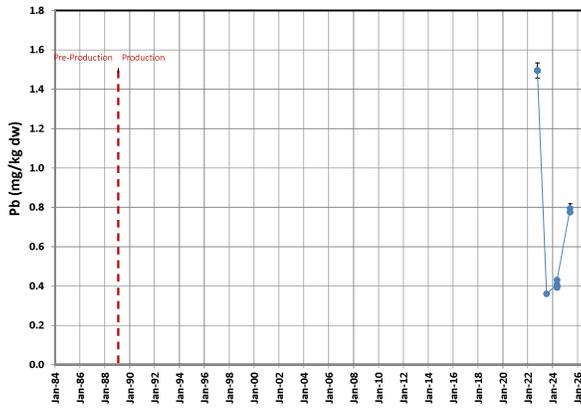


Figure 4-29. Mercury in Mussels at Site STN-6

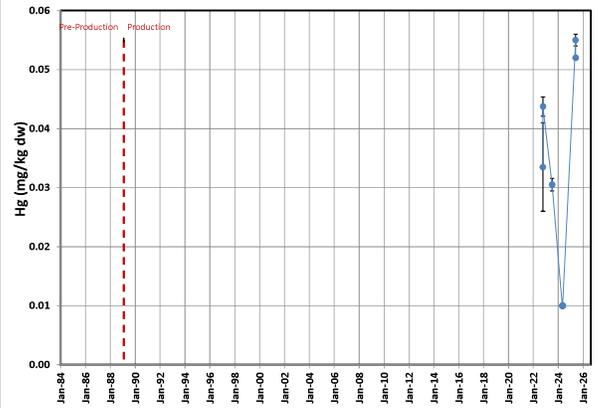


Figure 4-30. Zinc in Mussels at Site STN-6

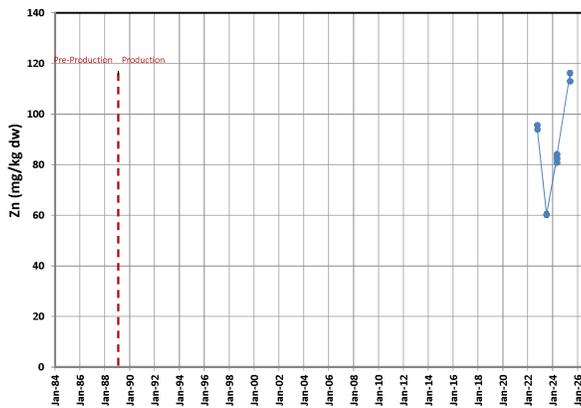


Figure 4-31. Cadmium in Nephthys at Site S-1

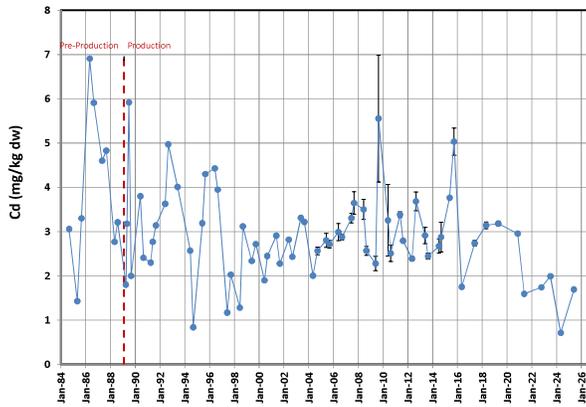


Figure 4-32. Copper in Nephthys at Site S-1

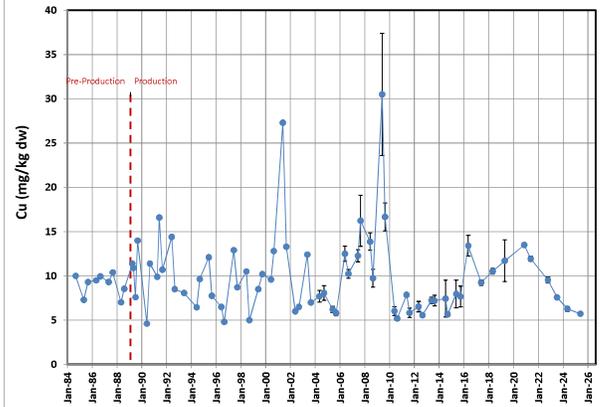


Figure 4-33. Lead in Nephthys at Site S-1

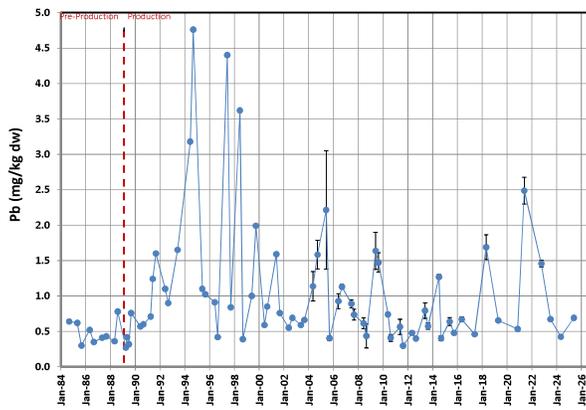


Figure 4-34. Mercury in Nephthys at Site S-1

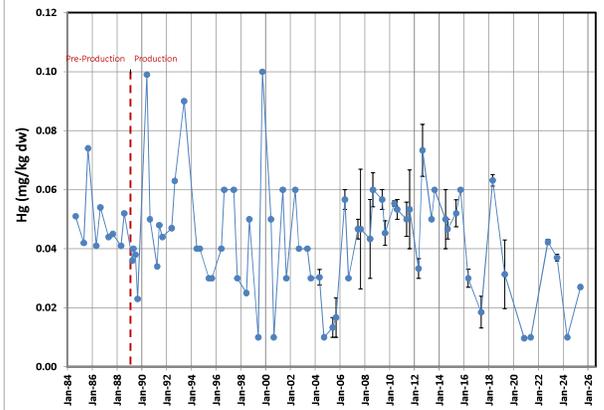


Figure 4-35. Zinc in Nephthys at Site S-1

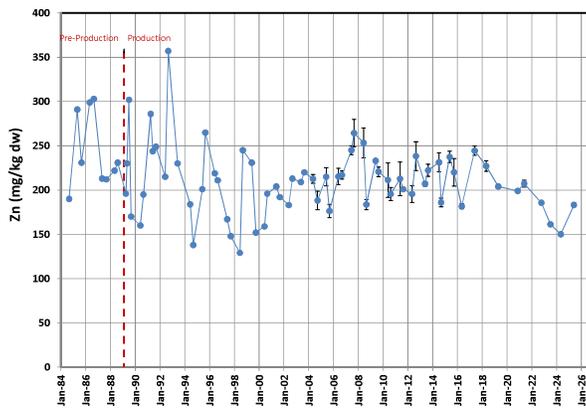


Figure 4-36. Cadmium in Nephthys at Site S-2

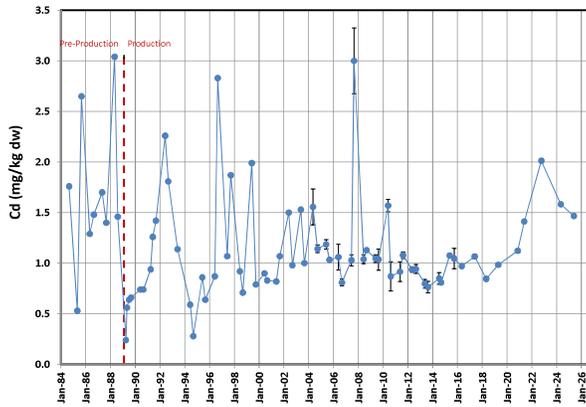


Figure 4-37. Copper in Nephthys at Site S-2

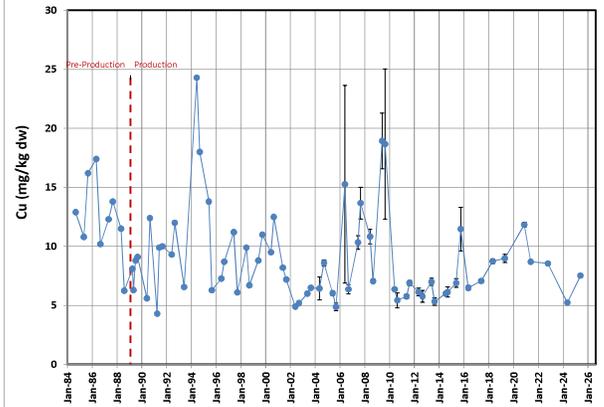


Figure 4-38. Lead in Nephthys at Site S-2

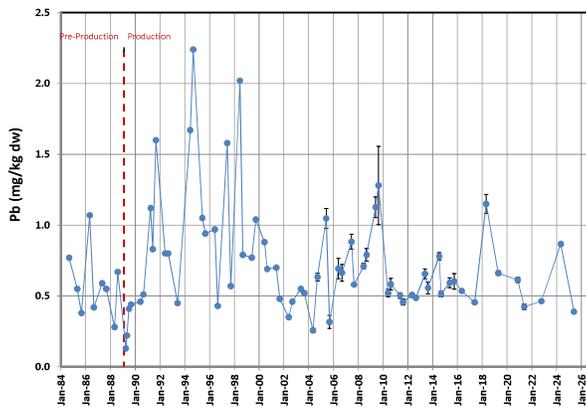


Figure 4-39. Mercury in Nephthys at Site S-2

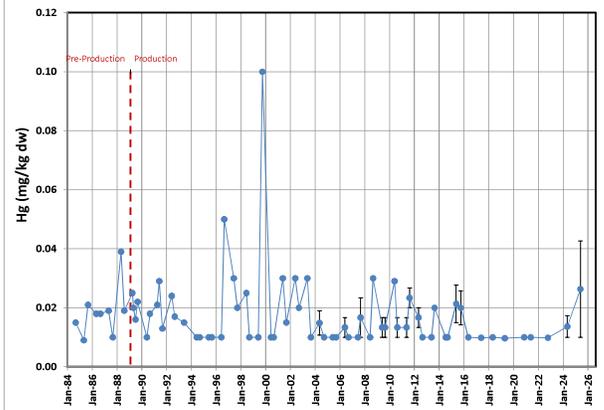


Figure 4-40. Zinc in Nephthys at Site S-2

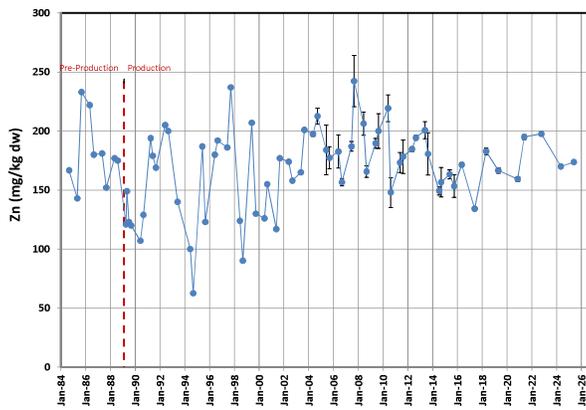


Figure 4-41. Cadmium in Nephthys at Site S-3

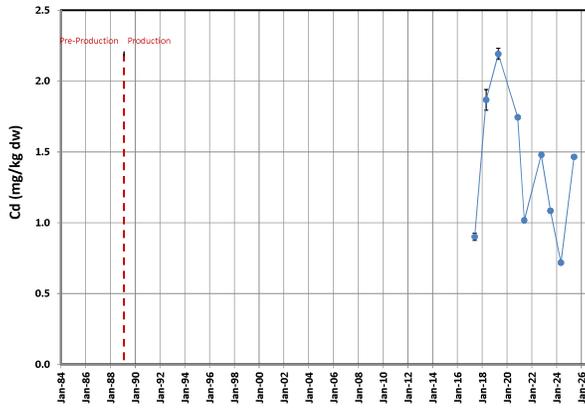


Figure 4-42. Copper in Nephthys at Site S-3

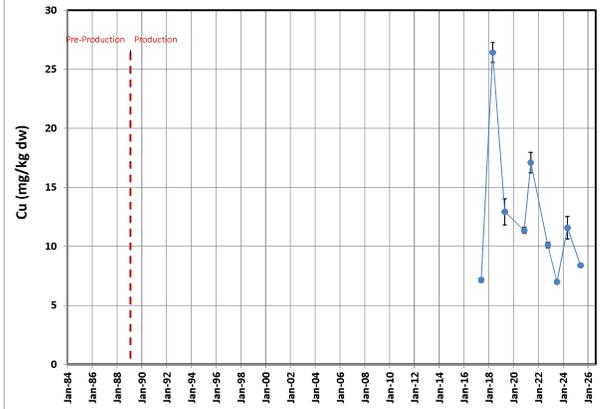


Figure 4-43. Lead in Nephthys at Site S-3

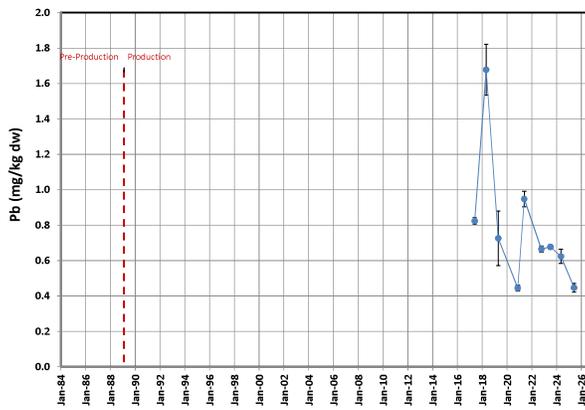


Figure 4-44. Mercury in Nephthys at Site S-3

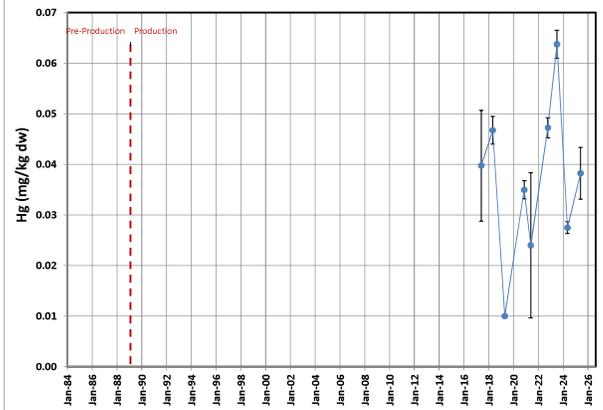


Figure 4-45. Zinc in Nephthys at Site S-3

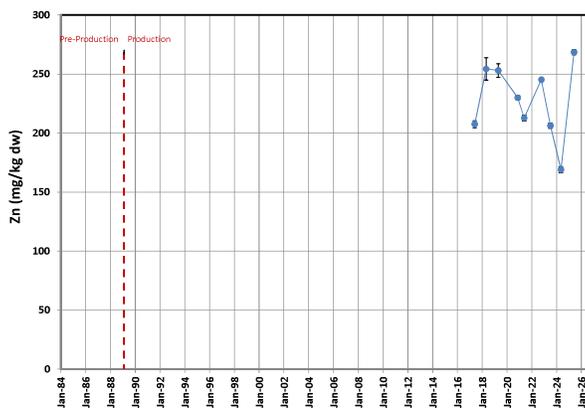


Figure 4-46. Cadmium in Nephthys at Site S-4

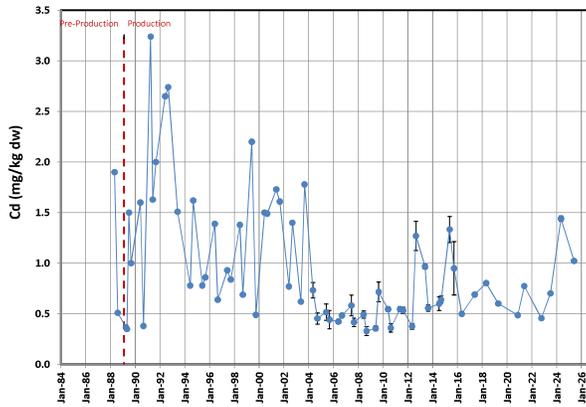


Figure 4-47. Copper in Nephthys at Site S-4

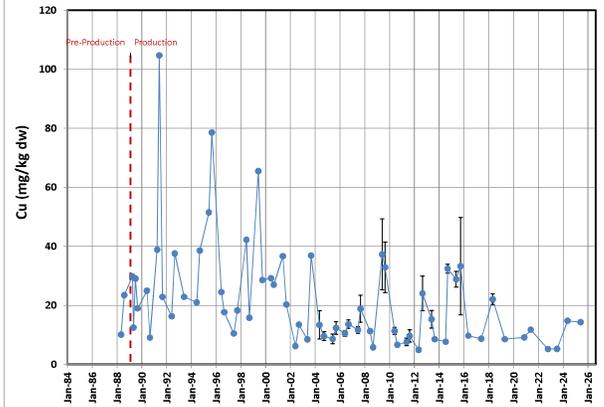


Figure 4-48. Lead in Nephthys at Site S-4

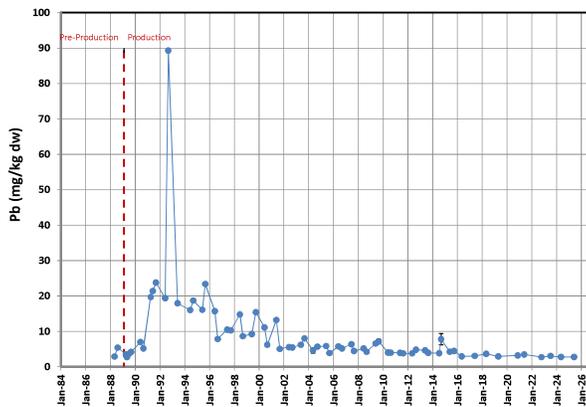


Figure 4-49. Mercury in Nephthys at Site S-4

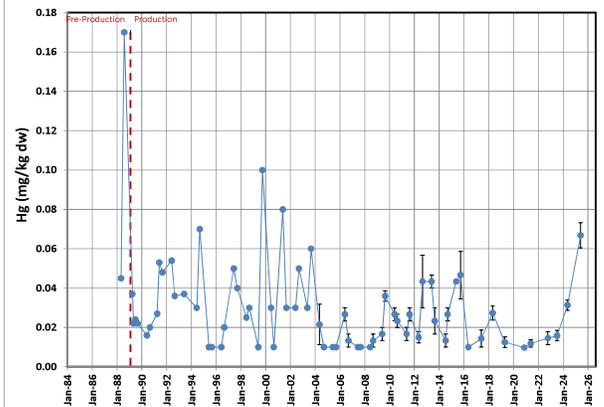


Figure 4-50. Zinc in Nephthys at Site S-4

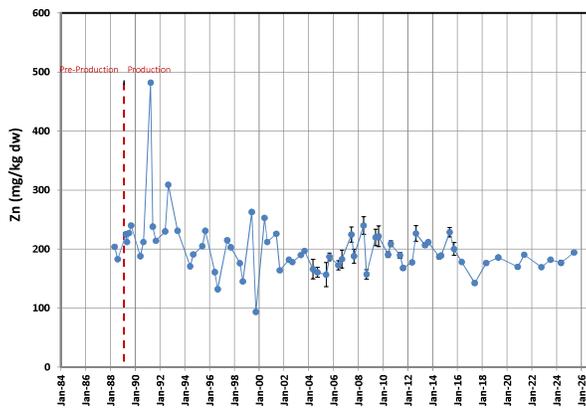


Figure 4-51. Cadmium in Nephthys at Site S-8

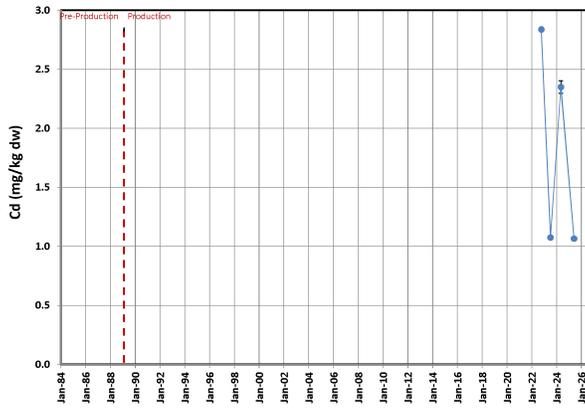


Figure 4-52. Copper in Nephthys at Site S-8

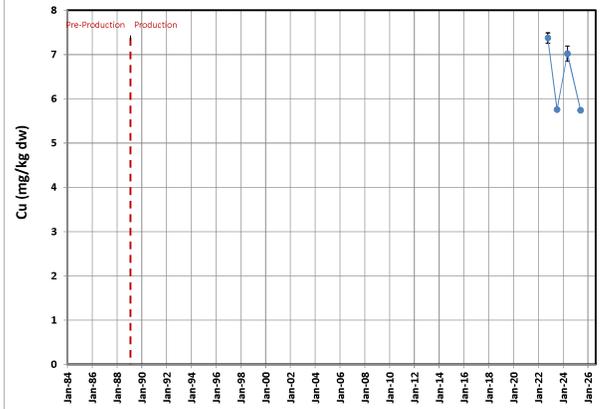


Figure 4-53. Lead in Nephthys at Site S-8

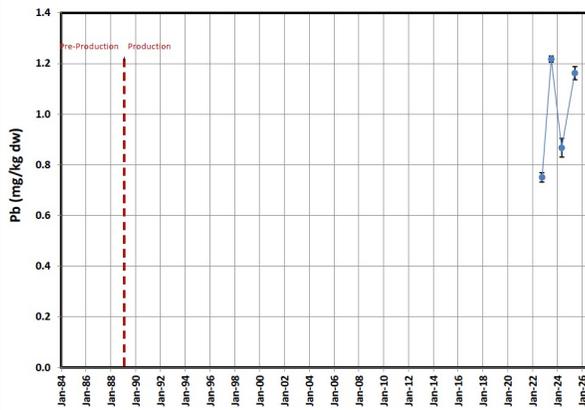


Figure 4-54. Mercury in Nephthys at Site S-8

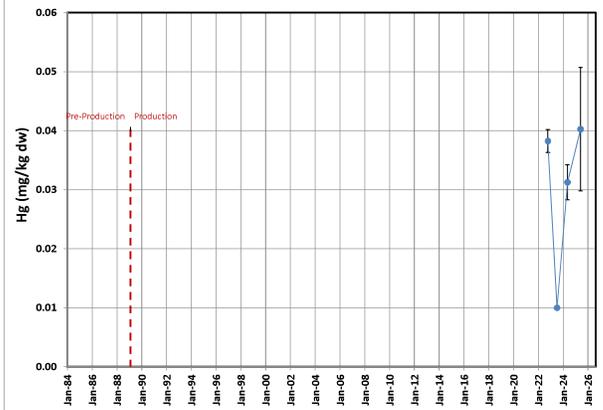


Figure 4-55. Zinc in Nephthys at Site S-8

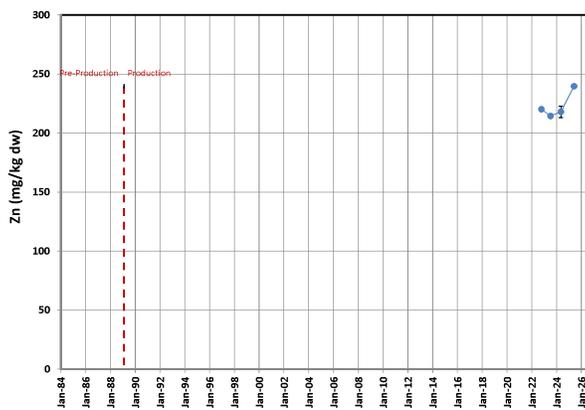


Figure 4-56. Cadmium in Nephthys at Site S-9

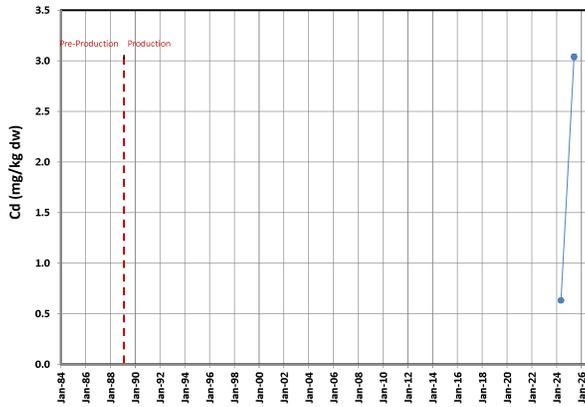


Figure 4-57. Copper in Nephthys at Site S-9

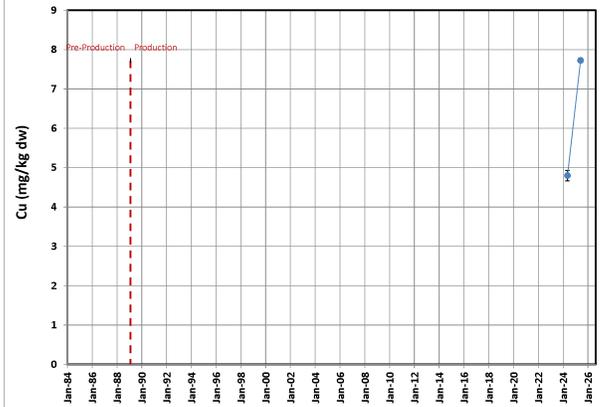


Figure 4-58. Lead in Nephthys at Site S-9

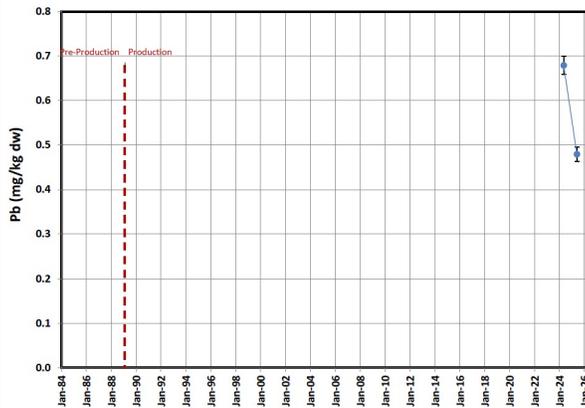


Figure 4-59. Mercury in Nephthys at Site S-9

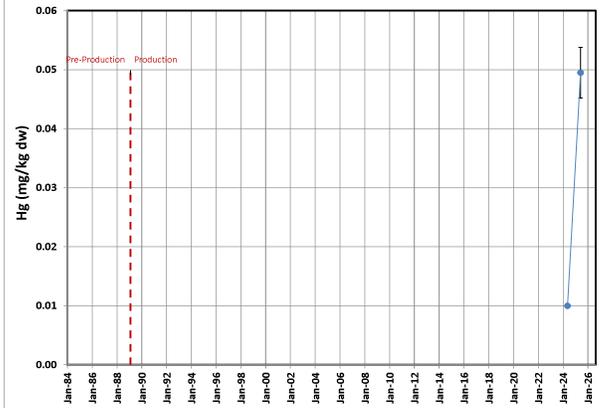
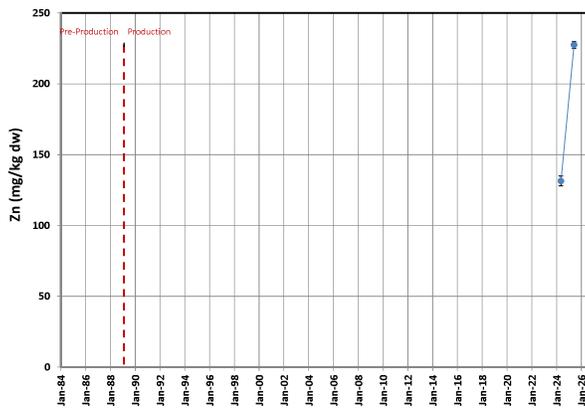


Figure 4-60. Zinc in Nephthys at Site S-9



7. APPENDICES

7.1. Appendix A - 002 Outfall & Diffuser Survey Report and Video Footage

7.2. Appendix B - Historical Hawk Inlet Data