

Summary of the Surveillance Data
Post reopening Grids C14-C16, C18, C20, C23-C25 (fish & shrimp)

Background: This area was re-opened to fishing on November 15 after the results of sensory and chemical testing on numerous fish and shrimp specimens showed that the seafood from this area was safe for consumption. To support consumer confidence and demonstrate that seafood from the area continues to be safe for consumption, the grids C14-C16, C18, C20, C23-C25 were re-sampled between November 24 and December 8, and again between December 7 and January 9. During both of these sampling efforts, 394 specimens (comprised of 1336 individual organisms) were taken representing the important reef fish and pelagic fish species, as well as shrimp species that occur in the area. These specimens were processed into samples for sensory and chemical analyses. The samples from the first pass were analyzed by both sensory and chemical methods and the samples from the second pass were analyzed for chemistry only. Because this is a surveillance program to confirm the results of the reopening, the analytical chemical analyses provide sufficient information to confirm that the seafood from an area continues to be safe for human consumption.

A gas chromatography/mass spectrometry (GC/MS) method was used to measure polycyclic aromatic hydrocarbons (PAHs) in seafood samples analyzed for re-opening of the grids and a high performance liquid chromatography/fluorescence method developed by the FDA (<http://www.fda.gov/downloads/ScienceResearch/UCM220209.pdf>) was used to analyze samples from surveillance of the reopened areas. Results from the FDA protocol are indicated by the superscript 2 (²) after the chemical test number in each table. The HPLC-UVF method provides reliable estimates of PAH levels in seafood. A minor difference between the two methods is that the HPLC method has higher limits of quantitation than the GC/MS method but this does not affect the ability to measure PAHs and determine if they are below the levels of concern. Because the HPLC method is faster, larger numbers of samples can be analyzed, thus increasing the capacity of the surveillance program.

The samples were also analyzed for dioctyl sodium sulfosuccinate (DOSS) a component of the dispersant used in response to the DWH spill. The HPLC MS/MS method that was jointly developed by FDA and NOAA was used (see “New Method for DOSS Detection in Seafood” at: <http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/Seafood/ucm210970.htm#DOSS>).

Surveillance Results: The sensory and chemistry results are in the accompanying table ([hyperlink](#)). The chemistry data reported for grids C14-C16, C18, C20, C23-C25 include both first and second passes. All samples passed sensory analysis and all PAH and DOSS levels were well below the levels of concern (LOC). The chemistry data are reported in nanograms per gram (parts per billion: ppb) PAH or micrograms per gram (parts per million: ppm) DOSS in edible tissues of the finfish collected. Above each compound symbol is a numeric value for the LOC expressed in ppb for PAHs or ppm DOSS. Chemistry results below the LOC for that particular PAH compound or DOSS show that the fish sample is safe for human consumption. Results that include the “less than” (<) symbol indicate results that are less than the limit of detection for PAHs determined by HPLC-UVF or below the limit of quantitation for DOSS determined by HPLC MS/MS. These values are the levels at which the analytical instrumentation can measure the quantity of the compound in a sample.

Comparison to Re-opening Results: To allow comparison of the surveillance chemistry data to the chemistry data for the reopening of this area, the following tables summarize the LOCs, as well as the range of concentrations of PAHs and DOSS measured in all of the samples analyzed.

The results for the surveillance sampling are comparable to the results for reopening, confirming that finfish from this area continue to be safe for human consumption. The only minor difference between the two sets of data is that the concentration of naphthalene is slightly higher in the surveillance samples than in the samples from reopening. This is due to a technical difference between the two methods. The HPLC method measures both parent (naphthalene) and alkylated PAHs (naphthalene with an alkyl group) whereas the GC/MS method measures only the parent PAH. The highest concentration of naphthalene (67 ng/g) measured in the surveillance samples, however, is about 490 times lower than the level of concern.

**Post reopening Grids C14-C16, C18, C20, C23-C25
(fish)**

PAHs	Level of Concern (ppb)	Data table symbol	Samples from November 15 re-opening	Samples from post re-opening surveillance
			Range of values (ppb) GC/MS analyses	Range of values (ppb) HPLC/fluorescence analyses^
Naphthalene	32,700	NPH	0.59 - 5.0	<10.55 - 67
Fluorene	65,300	FLU	<0.14 - 0.68	<1.0 - 4.5
Anthracene/Phenanthrene	490,000*	ANT/PHN	<0.30 - 1.1	<1.99 - 0.92
Pyrene	49,000	PYR	<0.16	<0.72
Fluoranthene	65,300	FLA	<0.0.074 - 0.14	<4.1
Chrysene	35,000	CHR	<0.10 - 0.15	<1.1
Benzo(k)fluoranthene	3,500	BKF	<0.28	<0.58
Benzo(b)fluoranthene	350	BBF	<0.28	<0.67
Benz(a)anthracene	350	BAA	<0.25	<0.59
Indeno(1,2,3-cd)pyrene	350	IDP	<0.25	<2.5
Dibenz(a,h)anthracene	35	DBA	<0.21	<5.3
Benzo(a)pyrene	35	BAP	<0.25	<1.1
DOSS	Level of Concern (ppm)		Range of values (ppm)	Range of values (ppm)
Diocylsulfosuccinate	100	DOSS	<0.045 - 0.74	<0.045

* Level of Concern for Anthracene and Phenanthrene combined

^ HPLC/fluorescence (screening) analyses have higher limits of quantitation than the more sensitive and laborious GC/MS analyses.

Post reopening Grids C14-C16, C18, C20, C23-C25 (shrimp)

PAHs	Level of Concern (ppb)	Data table symbol	Samples from November 15 re-opening	Samples from post re-opening surveillance
			Range of values (ppb) GC/MS analyses	Range of values (ppb) HPLC/fluorescence analyses [^]
Naphthalene	123,000	NPH	0.58 - 1.0	<3.4 - 20
Fluorene	246,000	FLU	<0.12 - <0.22	<0.69
Anthracene/Phenanthrene	1,846,000*	ANT/PHN	0.23 - 0.39	<0.70 - 0.69
Pyrene	185,000	PYR	<0.063 - <0.16	<0.29
Fluoranthene	246,000	FLA	<0.063 - <0.17	<0.25
Chrysene	132,000	CHR	<0.12 - <0.24	<1.4
Benzo(k)fluoranthene	13,200	BKF	<0.12 - <0.24	<0.37
Benzo(b)fluoranthene	1320	BBF	<0.12 - <0.24	<0.76
Benz(a)anthracene	1320	BAA	<0.11 - <0.21	<0.78
Indeno(1,2,3-cd)pyrene	1320	IDP	<0.11 - <0.21	<4.5
Dibenz(a,h)anthracene	132	DBA	<0.091 - <0.18	<6.2
Benzo(a)pyrene	132	BAP	<0.11 - <0.21	<0.53
DOSS	Level of Concern (ppm)		Range of values (ppm)	Range of values (ppm)
Diethylsulfosuccinate	500	DOSS	<0.045	<0.045

* Level of Concern for Anthracene and Phenanthrene combined

[^] HPLC/fluorescence (screening) analyses have higher limits of quantitation than the more sensitive and laborious GC/MS analyses.