



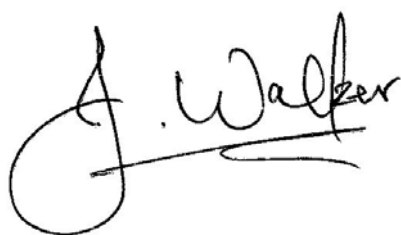
# Organic Contaminants in Sentinel Shellfish

2006 Data

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# Organic Contaminants in Sentinel Shellfish: 2006 Data

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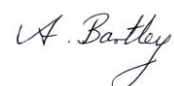
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# 1 Executive Summary

Samples of oysters from the Manukau Harbour and transplanted mussels from seven Auckland estuary and harbour sites were received in the NIWA laboratory on 21<sup>st</sup> December 2006. Five replicate samples of oysters from each of four sites were received, giving 20 oyster samples for analysis. Five replicate samples of mussels from each of seven sites and one sample labelled “predeployment” were received, giving 36 mussel samples for analysis. All samples were analysed for organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). Analytical data for oysters are listed in Tables 3–6 and analytical data for mussels are listed in Tables 7–14. Analytical procedures and a quality assurance summary are appended. Data for composite samples and archived samples are reproduced in Tables 15 and 16.

Lipid-normalised concentrations of a sub-set of major compounds for oysters (used in trend assessment) are presented in Table 1 to facilitate comparisons of contaminant concentrations between 2003 and 2006. Summary Tables of mean total contaminant levels and lipid-normalised concentrations for mussels have been compiled and presented in Tables 2a and 2b.

Total contaminant levels highlighted in red in Tables 3-14 were considered to be distinctly different from other values generated for remaining replicates from the same site. This data was omitted in calculating means and standard errors in Summary Tables 1, 2a and 2b.

Major features of the 2006 oyster data (lipid-normalised) were:

- The PAH levels in 2006 at most sites appeared to be slightly higher than those recorded previously.
- In general, DDT, chlordane and PCB levels were similar to those recorded in 2003.
- Dieldrin levels were observed at levels similar to those recorded in 2003 with higher levels observed at Pahurehure.
- Levels of contaminants at Granny’s Bay were higher than previously recorded.

Major features of the 2006 mussel data (lipid-normalised) were:

- Due to unknown contamination, dieldrin could not be quantified in the mussel samples. An attempt will be made to analyse these samples and present these data in a subsequent data report.
- PAH levels in 2006 were higher for all sites.
- In general, DDT, PCB and chlordane levels were similar or lower at all sites except Iliomana.
- Levels of all contaminants were elevated for Iliomana when compared with 2005 data.

## 2 Results

**Table 1:**

Comparison of mean concentrations of organic contaminants in oysters from 2003 to 2006. Concentrations (ng/g lipid) are lipid-normalised totals of a sub-set of major components used for temporal trend assessment

| Analyte         | Cornwallis Beach |           |           | Pahurehure Creek |           |           | Hingaia Bridge |           |           | Granny's Bay |          |          |
|-----------------|------------------|-----------|-----------|------------------|-----------|-----------|----------------|-----------|-----------|--------------|----------|----------|
|                 | 2006             | 2005      | 2003      | 2006             | 2005      | 2003      | 2006           | 2005      | 2003      | 2006         | 2005     | 2003     |
| Total PAH       | 141 (4)          | 119 (6)   | 128 (7)   | 552 (23)         | 520 (7)   | 463 (25)  | 370 (4)        | 326 (12)  | 342 (7)   | 757 (15)     | 594 (60) | 577 (25) |
| Total DDT       | 90 (5)           | 89 (3)    | 158 (4)   | 130 (3)          | 91 (3)    | 156 (9)   | 126 (4)        | 114 (7)   | 209 (7)   | 871 (39)     | 365 (16) | 789 (32) |
| Dieldrin        | 11 (1)           | 16 (4)    | 12 (2)    | 14 (1)           | 28 (4)    | 16 (1)    | 38 (2)         | 17 (2)    | 19 (1)    | 42 (2)       | 16 (1)   | 39 (2)   |
| Total PCB       | 49 (3)           | 54 (3)    | 74 (2)    | 81 (1)           | 59 (2)    | 76 (5)    | 63 (1)         | 54 (4)    | 69 (2)    | 347 (14)     | 158 (7)  | 302 (14) |
| Total Chlordane | 3.8 (0.3)        | 3.3 (0.4) | 6.9 (0.2) | 5.5 (0.3)        | 2.3 (0.3) | 4.6 (0.4) | 4.5 (0.2)      | 2.6 (0.4) | 5.3 (0.2) | 30 (0.3)     | 14 (0.8) | 34 (0.8) |

1. Total PAH = sum of fluoranthene, pyrene, benz[a]anthracene, chrysene, benzo[b]-fluoranthene, benzo[k]fluoranthene, and benzo[a]pyrene. Total DDT = sum of p,p'-DDE, p,p'-DDD, and p,p'-DDT. Total PCB = sum of congeners 118, 153, 138, and 180. Total chlordane = sum of cis-chlordane and trans-chlordane.
2. Numbers in parenthesis represent standard error in site replicates.
3. Numbers in red show mean concentrations generated from selected replicates at a given site.

**Table 2a:**

Mean concentrations of lipid (%) and organic contaminants (ng/g dry tissue) in mussels from each of the seven sample sites.

| Site            | Iliomana | Chelsea | Upper<br>Tamaki | Mangere<br>Inlet | Papakura<br>Channel | Upper<br>Waitemata | Weymouth |
|-----------------|----------|---------|-----------------|------------------|---------------------|--------------------|----------|
| Lipid (%)       | 7.3      | 5.9     | 5.0             | 5.6              | 6.0                 | 6.4                | 6.6      |
| Total PAH       | 50       | 111     | 107             | 49               | 18                  | 78                 | 21       |
| Total DDT       | 7.1      | 8.3     | 4.8             | 12               | 3.8                 | 10                 | 2.4      |
| Total Chlordane | 0.6      | 0.7     | 1.0             | 1.8              | 0.3                 | 1.0                | 0.1      |
| Total PCB       | 11       | 16      | 22              | 24               | 4.7                 | 18.9               | 4.3      |

**Table 2b:**

Mean lipid-normalised organic contaminant concentrations (ng/g lipid) in mussels from each of the seven sample sites.

| Site            | Iliomana  | Chelsea   | Upper<br>Tamaki | Mangere<br>Inlet | Papakura<br>Channel | Upper<br>Waitemata | Weymouth  |
|-----------------|-----------|-----------|-----------------|------------------|---------------------|--------------------|-----------|
| Lipid (%)       | 7.3 (0.1) | 5.9 (0.4) | 5.0 (0.1)       | 5.6 (0.1)        | 6.0 (0.1)           | 6.4 (0.3)          | 6.6 (0.1) |
| Total PAH       | 677 (23)  | 1900 (94) | 2130 (66)       | 887 (26)         | 301 (13)            | 1218 (39)          | 312 (1)   |
| Total DDT       | 98 (5)    | 140 (6)   | 95 (2)          | 216 (4)          | 64 (3)              | 158 (7)            | 36 (1)    |
| Total Chlordane | 9.0 (0.5) | 13 (0.8)  | 20 (0.5)        | 32 (0.8)         | 6.0 (0.5)           | 15 (0.2)           | 2.0 (0.1) |
| Total PCB       | 155 (5)   | 275 (8)   | 439 (10)        | 424 (11)         | 79 (3)              | 295 (11)           | 64 (1)    |

1. Numbers in parenthesis represent standard error in site replicates.

**Table 3:**

Organic contaminants in oysters at Cornwallis Beach (ng/g dry weight).

| NIWA Lab Code        | OA121/6 | OA121/7 | OA121/8 | OA121/9 | OA121/10 |
|----------------------|---------|---------|---------|---------|----------|
| ARC Sample Code      | COR 1   | COR 2   | COR 3   | COR 4   | COR 5    |
| Lipid Content (% DW) | 15.0    | 14.4    | 11.4    | 11.6    | 13.2     |
| PAHs                 |         |         |         |         |          |
| phenanthrene         | 3.0     | 2.8     | 2.8     | 2.3     | 2.8      |
| anthracene           | 0.2     | 0.2     | 0.2     | 0.2     | 0.2      |
| 1-methylphenanthrene | 1.6     | 1.5     | 1.6     | 1.1     | 1.5      |
| fluoranthene         | 6.4     | 6.3     | 5.4     | 4.9     | 6.2      |
| pyrene               | 4.8     | 4.6     | 4.2     | 3.6     | 4.7      |
| benz[a]anthracene    | 1.4     | 1.3     | 1.1     | 1.0     | 1.3      |
| chrysene             | 4.3     | 4.1     | 3.7     | 3.2     | 4.0      |
| benzo[b]fluoranthene | 2.5     | 2.3     | 2.3     | 1.8     | 2.3      |
| benzo[k]fluoranthene | 0.7     | 0.7     | 0.6     | 0.5     | 0.6      |
| benzo[e]pyrene       | 1.6     | 1.6     | 1.6     | 1.3     | 1.5      |
| benzo[a]pyrene       | 0.4     | 0.4     | 0.3     | 0.3     | 0.3      |
| perylene             | 5.6     | 2.6     | 2.4     | 1.9     | 2.5      |
| indeno[123-cd]pyrene | 0.3     | 0.3     | 0.3     | 0.3     | 0.4      |
| dibenz[ah]anthracene | < 0.2   | < 0.2   | < 0.2   | < 0.2   | < 0.2    |
| benzo[ghi]perylene   | 0.6     | 0.6     | 0.6     | 0.6     | 0.6      |
| Total PAH            | 33.2    | 29.1    | 27.1    | 23.0    | 29.0     |
| DDTs                 |         |         |         |         |          |
| o,p'-DDE             | 1.3     | 1.2     | 1.1     | 1.0     | 1.2      |
| p,p'-DDE             | 9.8     | 9.8     | 9.8     | 8.8     | 9.8      |
| o,p'-DDD             | 0.3     | 0.3     | 0.2     | 0.2     | 0.3      |
| p,p'-DDD             | 1.5     | 1.4     | 1.5     | 1.3     | 1.6      |
| o,p'-DDT             | 0.2     | 0.2     | 0.1     | 0.2     | 0.2      |
| p,p'-DDT             | 0.6     | 0.6     | 0.7     | 0.6     | 0.7      |
| Total DDT            | 13.7    | 13.5    | 13.4    | 12.1    | 13.8     |
| Chlordanes           |         |         |         |         |          |
| heptachlor           | < 0.2   | < 0.2   | < 0.2   | < 0.2   | < 0.2    |
| heptachlor epoxide   | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| t-chlordane          | 0.3     | 0.3     | 0.3     | 0.3     | 0.4      |
| c-chlordane          | 0.2     | 0.1     | 0.2     | 0.2     | 0.2      |
| t-nonachlor          | 0.3     | 0.3     | 0.3     | 0.3     | 0.3      |

| NIWA Lab Code     | OA121/6 | OA121/7 | OA121/8 | OA121/9 | OA121/10 |
|-------------------|---------|---------|---------|---------|----------|
| ARC Sample Code   | COR 1   | COR 2   | COR 3   | COR 4   | COR 5    |
| c-nonachlor       | 0.3     | 0.3     | 0.3     | 0.3     | 0.4      |
| Total Chlordane   | 1.1     | 1.0     | 1.1     | 1.1     | 1.3      |
| Other OCPs        |         |         |         |         |          |
| Hexachlorobenzene | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| lindane           | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| dieldrin          | 1.4     | 1.3     | 1.6     | 1.2     | 1.4      |
| PCBs              |         |         |         |         |          |
| 8                 | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 18                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 28                | 0.2     | 0.2     | 0.2     | 0.1     | 0.1      |
| 44                | < 0.1   | 0.1     | 0.1     | < 0.1   | < 0.1    |
| 49                | 0.2     | 0.2     | 0.1     | 0.1     | 0.1      |
| 52                | 0.3     | 0.3     | 0.3     | 0.2     | 0.3      |
| 66                | 0.2     | 0.2     | 0.2     | 0.2     | 0.2      |
| 77                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 86                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 101               | 1.0     | 1.0     | 1.0     | 0.9     | 1.0      |
| 105               | 0.3     | 0.2     | 0.2     | 0.2     | 0.3      |
| 110               | 0.8     | 0.8     | 0.7     | 0.6     | 0.7      |
| 118               | 1.0     | 1.0     | 1.0     | 0.9     | 1.0      |
| 121               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 126               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 128               | 0.2     | 0.2     | 0.2     | 0.2     | 0.2      |
| 138               | 1.8     | 1.8     | 1.8     | 1.8     | 1.8      |
| 141               | 0.1     | 0.1     | 0.1     | 0.1     | 0.1      |
| 151               | 0.4     | 0.4     | 0.4     | 0.3     | 0.4      |
| 153               | 3.2     | 3.3     | 3.4     | 3.1     | 3.2      |
| 156               | 0.1     | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 169               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 170               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 180               | 0.3     | 0.3     | 0.2     | 0.2     | 0.3      |
| 187               | 0.9     | 0.9     | 0.9     | 0.8     | 0.9      |
| 194               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 195               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 206               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 209               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| Total PCB         | 10.8    | 11.0    | 10.8    | 10.0    | 10.6     |

**Table 4:**

Organic contaminants in oysters at Pahurehure Inlet (ng/g dry weight),

| NIWA Lab Code        | OA121/1 | OA121/2 | OA121/3 | OA121/4 | OA121/5 |
|----------------------|---------|---------|---------|---------|---------|
| ARC Sample Code      | PAH 1   | PAH 2   | PAH 3   | PAH 4   | PAH 5   |
| Lipid Content (% DW) | 3.3     | 7.1     | 6.7     | 6.8     | 5.9     |
| PAHs                 |         |         |         |         |         |
| phenanthrene         | 1.8     | 3.0     | 3.1     | 3.3     | 3.0     |
| anthracene           | < 0.2   | < 0.2   | 0.2     | 0.2     | < 0.2   |
| 1-methylphenanthrene | 1.0     | 2.2     | 2.2     | 2.2     | 2.1     |
| fluoranthene         | 4.2     | 8.9     | 8.7     | 9.9     | 8.2     |
| pyrene               | 4.9     | 10.4    | 10.3    | 11.9    | 10.0    |
| benz[a]anthracene    | 0.8     | 2.2     | 2.2     | 2.8     | 2.1     |
| chrysene             | 3.0     | 6.5     | 6.4     | 7.8     | 6.6     |
| benzo[b]fluoranthene | 2.8     | 5.5     | 5.8     | 7.0     | 5.9     |
| benzo[k]fluoranthene | 0.7     | 1.5     | 1.6     | 2.0     | 1.6     |
| benzo[e]pyrene       | 1.8     | 4.0     | 4.2     | 4.8     | 4.2     |
| benzo[a]pyrene       | 0.5     | 0.6     | 0.7     | 0.8     | 0.6     |
| perylene             | 3.8     | 10.1    | 9.2     | 11.6    | 9.4     |
| indeno[123-cd]pyrene | 1.0     | 2.1     | 2.1     | 2.8     | 2.5     |
| dibenz[ah]anthracene | 0.2     | 0.5     | 0.5     | 0.7     | 0.6     |
| benzo[ghi]perylene   | 1.3     | 2.9     | 3.0     | 3.8     | 3.4     |
| Total PAH            | 27.8    | 60.4    | 60.2    | 71.7    | 60.2    |
| DDTs                 |         |         |         |         |         |
| o,p'-DDE             | < 0.1   | 0.2     | 0.2     | 0.2     | 0.2     |
| p,p'-DDE             | 3.7     | 6.8     | 7.0     | 7.2     | 6.1     |
| o,p'-DDD             | < 0.1   | 0.2     | 0.2     | 0.2     | 0.2     |
| p,p'-DDD             | 0.4     | 1.0     | 1.1     | 1.1     | 0.9     |
| o,p'-DDT             | 0.1     | 0.3     | 0.3     | 0.4     | 0.3     |
| p,p'-DDT             | 0.3     | 0.7     | 0.7     | 0.8     | 0.6     |
| Total DDT            | 4.6     | 9.1     | 9.5     | 9.8     | 8.3     |
| Chlordanes           |         |         |         |         |         |
| heptachlor           | < 0.2   | < 0.2   | < 0.2   | < 0.2   | < 0.2   |
| heptachlor epoxide   | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| t-chlordane          | 0.1     | 0.2     | 0.2     | 0.2     | 0.2     |
| c-chlordane          | 0.1     | 0.1     | 0.1     | 0.1     | 0.1     |
| t-nonachlor          | 0.1     | 0.3     | 0.2     | 0.2     | 0.2     |

| NIWA Lab Code     | OA121/1 | OA121/2 | OA121/3 | OA121/4 | OA121/5 |
|-------------------|---------|---------|---------|---------|---------|
| ARC Sample Code   | PAH 1   | PAH 2   | PAH 3   | PAH 4   | PAH 5   |
| c-nonachlor       | 0.1     | 0.1     | 0.1     | 0.1     | 0.1     |
| Total Chlordane   | 0.4     | 0.7     | 0.6     | 0.6     | 0.6     |
| Other OCPs        |         |         |         |         |         |
| Hexachlorobenzene | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| lindane           | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| dieldrin          | 0.4     | 1.0     | 0.9     | 1.0     | 1.0     |
| PCBs              |         |         |         |         |         |
| 8                 | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 18                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 28                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 44                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 49                | 0.1     | 0.1     | 0.1     | 0.1     | 0.1     |
| 52                | 0.1     | 0.2     | 0.2     | 0.2     | 0.2     |
| 66                | < 0.1   | 0.1     | 0.1     | 0.1     | 0.1     |
| 77                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 86                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 101               | 0.4     | 0.8     | 0.8     | 0.8     | 0.7     |
| 105               | 0.1     | 0.2     | 0.2     | 0.2     | 0.2     |
| 110               | 0.3     | 0.6     | 0.6     | 0.6     | 0.5     |
| 118               | 0.4     | 0.7     | 0.7     | 0.7     | 0.6     |
| 121               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 126               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 128               | 0.1     | 0.2     | 0.2     | 0.2     | 0.2     |
| 138               | 0.8     | 1.7     | 1.8     | 1.7     | 1.5     |
| 141               | < 0.1   | 0.1     | < 0.1   | 0.1     | < 0.1   |
| 151               | 0.2     | 0.3     | 0.3     | 0.3     | 0.3     |
| 153               | 1.5     | 2.8     | 3.0     | 2.8     | 2.4     |
| 156               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 169               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 170               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 180               | 0.1     | 0.2     | 0.2     | 0.3     | 0.2     |
| 187               | 0.4     | 0.8     | 0.9     | 0.8     | 0.7     |
| 194               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 195               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 206               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 209               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| Total PCB         | 4.3     | 8.9     | 9.1     | 9.0     | 7.7     |

**Table 5:**

Organic contaminants in oysters at Hingaia Bridge (ng/g dry weight).

| NIWA Lab Code        | OA121/16 | OA121/17 | OA121/18 | OA121/19 | OA121/20 |
|----------------------|----------|----------|----------|----------|----------|
| ARC Sample Code      | HIN 1    | HIN 2    | HIN 3    | HIN 4    | HIN 5    |
| Lipid Content (% DW) | 5.0      | 7.6      | 6.3      | 6.2      | 8.9      |
| PAHs                 |          |          |          |          |          |
| phenanthrene         | 1.6      | 2.9      | 2.1      | 2.1      | 3.2      |
| anthracene           | < 0.2    | 0.3      | < 0.2    | 0.2      | 0.2      |
| 1-methylphenanthrene | 1.1      | 2.1      | 1.4      | 1.5      | 2.3      |
| fluoranthene         | 4.3      | 7.6      | 6.0      | 6.1      | 8.7      |
| pyrene               | 4.7      | 8.3      | 6.7      | 6.5      | 9.5      |
| benz[a]anthracene    | 1.1      | 1.7      | 1.4      | 1.4      | 2.0      |
| chrysene             | 3.4      | 5.2      | 4.3      | 4.4      | 6.0      |
| benzo[b]fluoranthene | 3.1      | 4.1      | 3.7      | 3.6      | 4.8      |
| benzo[k]fluoranthene | 0.9      | 1.1      | 1.0      | 1.0      | 1.3      |
| benzo[e]pyrene       | 2.1      | 3.1      | 2.7      | 2.5      | 3.4      |
| benzo[a]pyrene       | 0.4      | 0.5      | 0.5      | 0.5      | 0.6      |
| perylene             | 3.5      | 4.8      | 4.5      | 3.7      | 6.0      |
| indeno[123-cd]pyrene | 0.9      | 1.0      | 1.3      | 1.2      | 1.3      |
| dibenz[ah]anthracene | 0.2      | 0.3      | 0.3      | 0.3      | 0.4      |
| benzo[ghi]perylene   | 1.6      | 1.7      | 2.0      | 1.8      | 2.1      |
| Total PAH            | 28.8     | 44.4     | 37.9     | 36.8     | 51.7     |
| DDTs                 |          |          |          |          |          |
| o,p'-DDE             | < 0.1    | 0.2      | 0.1      | 0.1      | 0.2      |
| p,p'-DDE             | 5.2      | 8.2      | 5.9      | 6.4      | 9.8      |
| o,p'-DDD             | 0.1      | 0.2      | 0.2      | 0.2      | 0.2      |
| p,p'-DDD             | 0.6      | 1.1      | 0.8      | 0.8      | 1.4      |
| o,p'-DDT             | 0.1      | 0.3      | 0.1      | 0.2      | 0.3      |
| p,p'-DDT             | 0.3      | 0.8      | 0.5      | 0.5      | 1.1      |
| Total DDT            | 6.4      | 10.7     | 7.6      | 8.2      | 13.1     |
| Chlordanes           |          |          |          |          |          |
| heptachlor           | < 0.2    | < 0.2    | < 0.2    | < 0.2    | < 0.2    |
| heptachlor epoxide   | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| t-chlordane          | 0.2      | 0.2      | 0.2      | 0.1      | 0.3      |
| c-chlordane          | 0.1      | 0.2      | 0.1      | 0.1      | 0.1      |
| t-nonachlor          | 0.1      | 0.2      | 0.2      | 0.2      | 0.3      |

| NIWA Lab Code     | OA121/16 | OA121/17 | OA121/18 | OA121/19 | OA121/20 |
|-------------------|----------|----------|----------|----------|----------|
| ARC Sample Code   | HIN 1    | HIN 2    | HIN 3    | HIN 4    | HIN 5    |
| c-nonachlor       | 0.1      | 0.1      | 0.1      | 0.1      | 0.2      |
| Total Chlordane   | 0.5      | 0.7      | 0.6      | 0.5      | 0.8      |
| Other OCPs        |          |          |          |          |          |
| Hexachlorobenzene | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| lindane           | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| dieldrin          | 2.1      | 2.6      | 2.4      | 2.4      | 1.3      |
| PCBs              |          |          |          |          |          |
| 8                 | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 18                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 28                | < 0.1    | 0.1      | 0.1      | 0.1      | 0.1      |
| 44                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 49                | < 0.1    | 0.1      | < 0.1    | < 0.1    | 0.1      |
| 52                | 0.1      | 0.2      | 0.1      | 0.1      | 0.2      |
| 66                | < 0.1    | 0.1      | < 0.1    | 0.1      | 0.1      |
| 77                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 86                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 101               | 0.4      | 0.6      | 0.4      | 0.5      | 0.7      |
| 105               | 0.1      | 0.2      | 0.1      | 0.1      | 0.2      |
| 110               | 0.3      | 0.5      | 0.3      | 0.3      | 0.5      |
| 118               | 0.4      | 0.6      | 0.5      | 0.5      | 0.7      |
| 121               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 126               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 128               | 0.1      | 0.2      | 0.1      | 0.1      | 0.2      |
| 138               | 1.1      | 1.5      | 1.3      | 1.3      | 1.8      |
| 141               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 151               | 0.2      | 0.2      | 0.2      | 0.2      | 0.3      |
| 153               | 1.8      | 2.4      | 1.9      | 2.0      | 2.8      |
| 156               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 169               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 170               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 180               | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| 187               | 0.6      | 0.9      | 0.6      | 0.7      | 1.1      |
| 194               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 195               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 206               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 209               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| Total PCB         | 5.1      | 7.8      | 5.8      | 6.2      | 9.1      |

**Table 6:**

Organic contaminants in oysters at Granny's Bay (ng/g dry weight).

| NIWA Lab Code        | OA121/11 | OA121/12 | OA121/13 | OA121/14 | OA121/15 |
|----------------------|----------|----------|----------|----------|----------|
| ARC Sample Code      | GRA 1    | GRA 2    | GRA 3    | GRA 4    | GRA 5    |
| Lipid Content (% DW) | 5.3      | 5.5      | 4.4      | 5.5      | 5.5      |
| PAHs                 |          |          |          |          |          |
| phenanthrene         | 2.7      | 2.9      | 2.3      | 2.7      | 2.9      |
| anthracene           | 0.2      | 0.3      | 0.2      | 0.3      | 0.3      |
| 1-methylphenanthrene | 1.8      | 1.8      | 1.5      | 2.0      | 2.0      |
| fluoranthene         | 8.4      | 8.5      | 6.9      | 8.6      | 9.8      |
| pyrene               | 11.3     | 11.5     | 9.5      | 12.3     | 13.3     |
| benz[a]anthracene    | 2.4      | 2.5      | 2.1      | 2.7      | 3.2      |
| chrysene             | 8.1      | 8.3      | 6.6      | 8.0      | 8.9      |
| benzo[b]fluoranthene | 6.8      | 6.6      | 5.6      | 6.3      | 6.8      |
| benzo[k]fluoranthene | 2.0      | 1.9      | 1.7      | 1.9      | 2.0      |
| benzo[e]pyrene       | 5.1      | 5.0      | 4.2      | 5.1      | 5.6      |
| benzo[a]pyrene       | 0.7      | 0.7      | 0.7      | 0.8      | 0.9      |
| perylene             | 2.7      | 3.2      | 6.3      | 3.5      | 4.0      |
| indeno[123-cd]pyrene | 3.0      | 2.6      | 2.6      | 2.2      | 2.3      |
| dibenz[ah]anthracene | 0.9      | 0.8      | 0.8      | 0.6      | 0.7      |
| benzo[ghi]perylene   | 4.2      | 3.8      | 3.4      | 3.5      | 3.6      |
| Total PAH            | 60.3     | 60.5     | 54.5     | 60.4     | 66.2     |
| DDTs                 |          |          |          |          |          |
| o,p'-DDE             | 1.1      | 1.0      | 0.8      | 1.1      | 1.1      |
| p,p'-DDE             | 47.6     | 42.0     | 31.3     | 47.1     | 39.7     |
| o,p'-DDD             | 0.8      | 0.8      | 0.6      | 0.8      | 0.7      |
| p,p'-DDD             | 3.5      | 3.4      | 2.5      | 3.7      | 3.8      |
| o,p'-DDT             | 0.5      | 0.5      | 0.4      | 0.5      | 0.6      |
| p,p'-DDT             | 1.1      | 0.8      | 0.7      | 0.9      | 0.7      |
| Total DDT            | 54.6     | 48.5     | 36.2     | 54.1     | 46.6     |
| Chlordanes           |          |          |          |          |          |
| heptachlor           | < 0.2    | < 0.2    | < 0.2    | < 0.2    | < 0.2    |
| heptachlor epoxide   | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| t-chlordane          | 1.1      | 1.1      | 0.8      | 1.1      | 1.1      |
| c-chlordane          | 0.5      | 0.6      | 0.5      | 0.5      | 0.5      |
| t-nonachlor          | 0.8      | 0.8      | 0.6      | 0.7      | 0.6      |
| c-nonachlor          | 0.9      | 0.9      | 0.7      | 0.9      | 0.9      |

| NIWA Lab Code     | OA121/11 | OA121/12 | OA121/13 | OA121/14 | OA121/15 |
|-------------------|----------|----------|----------|----------|----------|
| ARC Sample Code   | GRA 1    | GRA 2    | GRA 3    | GRA 4    | GRA 5    |
| Total Chlordane   | 3.3      | 3.4      | 2.6      | 3.2      | 3.1      |
| Other OCPs        |          |          |          |          |          |
| Hexachlorobenzene | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| lindane           | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| dieldrin          | 2.4      | 2.1      | 1.8      | 2.4      | 2.5      |
| PCBs              |          |          |          |          |          |
| 8                 | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 18                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 28                | 0.6      | 0.5      | 0.4      | 0.6      | 0.7      |
| 44                | 0.3      | 0.3      | 0.2      | 0.3      | 0.4      |
| 49                | 0.6      | 0.5      | 0.4      | 0.6      | 0.6      |
| 52                | 1.0      | 1.0      | 0.7      | 1.0      | 1.0      |
| 66                | 0.8      | 0.7      | 0.6      | 0.9      | 0.8      |
| 77                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 86                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 101               | 3.7      | 3.5      | 2.5      | 3.6      | 3.4      |
| 105               | 0.9      | 0.9      | 0.6      | 0.8      | 0.8      |
| 110               | 2.7      | 2.6      | 1.8      | 2.7      | 2.7      |
| 118               | 3.5      | 3.4      | 2.3      | 3.4      | 3.2      |
| 121               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 126               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 128               | 0.5      | 0.5      | 0.4      | 0.4      | 0.5      |
| 138               | 6.2      | 5.7      | 3.8      | 5.2      | 5.2      |
| 141               | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| 151               | 1.2      | 1.1      | 0.8      | 1.1      | 1.0      |
| 153               | 10.7     | 9.7      | 7.2      | 10.1     | 9.0      |
| 156               | 0.2      | 0.2      | 0.1      | 0.2      | 0.2      |
| 169               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 170               | 0.1      | 0.1      | < 0.1    | < 0.1    | 0.1      |
| 180               | 0.6      | 0.5      | 0.4      | 0.5      | 0.5      |
| 187               | 2.4      | 2.4      | 1.7      | 2.4      | 2.4      |
| 194               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 195               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 206               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 209               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| Total PCB         | 36.2     | 33.8     | 24.1     | 34.1     | 32.6     |

**Table 7:**

Organic contaminants in mussels from Iliomana (ng/g dry weight).

| Niwa Lab Code        | OA122/1 | OA122/2 | OA122/3 | OA122/4 | OA122/5 |
|----------------------|---------|---------|---------|---------|---------|
| ARC Sample Code      | # 1     | # 2     | # 3     | # 4     | # 5     |
| Lipid Content (% DW) | 7.0     | 7.1     | 7.4     | 7.6     | 7.6     |
| PAHs                 |         |         |         |         |         |
| phenanthrene         | 3.4     | 3.4     | 2.9     | 2.6     | 3.2     |
| anthracene           | 0.6     | 0.6     | 0.7     | 0.5     | 0.6     |
| 1-methylphenanthrene | 0.9     | 0.9     | 0.8     | 0.8     | 1.0     |
| fluoranthene         | 5.7     | 6.2     | 6.5     | 5.2     | 6.1     |
| pyrene               | 5.8     | 6.4     | 6.7     | 5.5     | 6.5     |
| benz[a]anthracene    | 2.6     | 2.9     | 3.0     | 2.6     | 2.9     |
| chrysene             | 4.3     | 4.8     | 4.3     | 4.2     | 4.9     |
| benzo[b]fluoranthene | 5.4     | 6.1     | 5.6     | 5.5     | 6.1     |
| benzo[k]fluoranthene | 2.0     | 2.3     | 2.1     | 2.0     | 2.3     |
| benzo[e]pyrene       | 2.5     | 2.9     | 2.8     | 2.5     | 3.1     |
| benzo[a]pyrene       | 3.0     | 3.6     | 4.0     | 3.1     | 3.6     |
| perylene             | 2.0     | 2.3     | 2.3     | 2.0     | 2.4     |
| indeno[123-cd]pyrene | 3.8     | 4.4     | 4.5     | 3.8     | 4.4     |
| dibenz[ah]anthracene | 0.8     | 1.0     | 1.0     | 0.8     | 1.0     |
| benzo[ghi]perylene   | 3.9     | 4.6     | 4.4     | 3.9     | 4.6     |
| Total PAH            | 46.9    | 52.2    | 51.5    | 45.1    | 52.5    |
| DDTs                 |         |         |         |         |         |
| o,p-DDE              | 0.3     | 0.3     | 0.2     | 0.2     | 0.3     |
| p,p'-DDE             | 1.6     | 1.7     | 1.4     | 1.6     | 1.9     |
| o,p-DDD              | 0.7     | 0.7     | 0.6     | 0.7     | 0.7     |
| p,p-DDD              | 2.1     | 2.0     | 1.7     | 2.0     | 2.1     |
| o,p-DDT              | 0.5     | 0.6     | 0.4     | 0.5     | 0.5     |
| p,p'-DDT             | 2.2     | 2.2     | 1.6     | 2.1     | 2.1     |
| Total DDT            | 7.4     | 7.4     | 6.0     | 7.2     | 7.7     |
| Chlordanes           |         |         |         |         |         |
| heptachlor           | < 0.2   | < 0.2   | < 0.2   | < 0.2   | < 0.2   |
| heptachlor epox      | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| trans-chlordane      | 0.2     | 0.2     | 0.2     | 0.2     | 0.2     |
| cis-chlordane        | 0.1     | 0.1     | 0.1     | 0.1     | 0.1     |
| trans-nonachlor      | 0.2     | 0.2     | 0.2     | 0.2     | 0.2     |

| Niwa Lab Code     | OA122/1 | OA122/2 | OA122/3 | OA122/4 | OA122/5 |
|-------------------|---------|---------|---------|---------|---------|
| ARC Sample Code   | # 1     | # 2     | # 3     | # 4     | # 5     |
| cis-nonachlor     | 0.1     | 0.1     | 0.1     | 0.1     | 0.1     |
| Total Chlordane   | 0.7     | 0.7     | 0.5     | 0.6     | 0.7     |
| Other OCPs        |         |         |         |         |         |
| Hexachlorobenzene | 0.4     | 0.4     | 0.3     | 0.3     | 0.4     |
| lindane           | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| dieldrin          |         |         |         |         |         |
| PCBs              |         |         |         |         |         |
| 8                 | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 18                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 28                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 44                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 49                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 52                | 0.2     | 0.2     | 0.2     | 0.2     | 0.2     |
| 66                | 0.1     | 0.1     | 0.1     | 0.1     | 0.1     |
| 77                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 86                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 101               | 0.3     | 0.3     | 0.3     | 0.3     | 0.3     |
| 105               | 0.3     | 0.2     | 0.2     | 0.3     | 0.3     |
| 110               | 0.1     | 0.1     | 0.1     | 0.1     | 0.1     |
| 118               | 0.9     | 0.8     | 0.7     | 0.9     | 0.9     |
| 121               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 126               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 128               | 0.4     | 0.4     | 0.3     | 0.4     | 0.4     |
| 138               | 3.1     | 2.8     | 2.6     | 3.0     | 3.3     |
| 141               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | 0.1     |
| 151               | 0.3     | 0.3     | 0.3     | 0.3     | 0.4     |
| 153               | 3.5     | 3.3     | 3.0     | 3.4     | 3.8     |
| 156               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 169               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 170               | 0.4     | 0.4     | 0.4     | 0.4     | 0.5     |
| 180               | 0.9     | 0.9     | 0.8     | 0.9     | 1.0     |
| 187               | 1.0     | 0.9     | 0.9     | 1.0     | 1.1     |
| 194               | 0.1     | 0.1     | 0.1     | 0.1     | 0.1     |
| 195               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 206               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| 209               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| Total PCB         | 11.6    | 11.0    | 10.2    | 11.4    | 12.7    |

**Table 8:**

Organic contaminants in mussels from Chelsea (ng/g dry weight).

| NIWA Lab Code        | OA122/6 | OA122/7 | OA122/8 | OA122/9 | OA122/10 |
|----------------------|---------|---------|---------|---------|----------|
| ARC Sample Code      | # 1     | # 2     | # 3     | # 4     | # 5      |
| Lipid Content (% DW) | 5.5     | 7.1     | 4.9     | 5.9     | 5.9      |
| PAHs                 |         |         |         |         |          |
| phenanthrene         | 6.3     | 7.6     | 5.8     | 5.0     | 6.1      |
| anthracene           | 1.2     | 1.3     | 1.0     | 0.9     | 1.2      |
| 1-methylphenanthrene | 2.1     | 2.5     | 2.0     | 1.7     | 1.9      |
| fluoranthene         | 14.5    | 14.6    | 10.3    | 10.8    | 14.0     |
| pyrene               | 14.9    | 15.1    | 11.0    | 11.0    | 14.9     |
| benz[a]anthracene    | 6.7     | 7.1     | 5.2     | 5.3     | 7.1      |
| chrysene             | 10.3    | 11.6    | 8.6     | 8.3     | 10.4     |
| benzo[b]fluoranthene | 12.9    | 14.2    | 10.7    | 10.8    | 13.7     |
| benzo[k]fluoranthene | 4.8     | 5.3     | 4.0     | 4.1     | 5.2      |
| benzo[e]pyrene       | 7.1     | 7.4     | 5.6     | 5.5     | 7.2      |
| benzo[a]pyrene       | 8.0     | 8.8     | 6.6     | 6.6     | 8.8      |
| perylene             | 6.9     | 7.5     | 6.0     | 7.2     | 7.7      |
| indeno[123-cd]pyrene | 9.4     | 9.9     | 7.6     | 7.6     | 9.8      |
| dibenz[ah]anthracene | 2.1     | 2.3     | 1.8     | 1.9     | 2.3      |
| benzo[ghi]perylene   | 10.2    | 10.8    | 8.3     | 8.3     | 10.7     |
| Total PAH            | 117.4   | 126.2   | 94.5    | 95.0    | 120.8    |
| DDTs                 |         |         |         |         |          |
| o,p'-DDE             | 0.2     | 0.3     | 0.2     | 0.3     | 0.3      |
| p,p'-DDE             | 2.7     | 4.0     | 2.0     | 3.5     | 3.3      |
| o,p'-DDD             | 0.8     | 0.9     | 0.5     | 0.8     | 0.8      |
| p,p'-DDD             | 2.0     | 2.6     | 1.5     | 2.3     | 2.3      |
| o,p'-DDT             | 0.6     | 0.6     | 0.4     | 0.5     | 0.5      |
| p,p'-DDT             | 1.4     | 1.8     | 1.0     | 1.6     | 1.6      |
| Total DDT            | 7.7     | 10.1    | 5.7     | 9.0     | 8.8      |
| Chlordanes           |         |         |         |         |          |
| heptachlor           | < 0.2   | < 0.2   | < 0.2   | < 0.2   | < 0.2    |
| heptachlor epoxide   | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| t-chlordane          | 0.3     | 0.3     | 0.2     | 0.2     | 0.2      |
| c-chlordane          | 0.2     | 0.2     | 0.1     | 0.2     | 0.2      |
| t-nonachlor          | 0.2     | 0.2     | 0.1     | 0.2     | 0.2      |

| NIWA Lab Code     | OA122/6 | OA122/7 | OA122/8 | OA122/9 | OA122/10 |
|-------------------|---------|---------|---------|---------|----------|
| ARC Sample Code   | # 1     | # 2     | # 3     | # 4     | # 5      |
| c-nonachlor       | 0.1     | 0.2     | 0.1     | 0.2     | 0.2      |
| Total Chlordane   | 0.8     | 0.8     | 0.5     | 0.8     | 0.8      |
| Other OCPs        |         |         |         |         |          |
| Hexachlorobenzene | 0.6     | 0.8     | 0.5     | 0.5     | 0.5      |
| lindane           | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| dieldrin          |         |         |         |         |          |
| PCBs              |         |         |         |         |          |
| 8                 | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 18                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 28                | 0.2     | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 44                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 49                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 52                | 0.3     | 0.3     | 0.2     | 0.3     | 0.3      |
| 66                | 0.2     | 0.2     | 0.1     | 0.2     | 0.2      |
| 77                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 86                | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 101               | 0.5     | 0.5     | 0.3     | 0.4     | 0.4      |
| 105               | 0.4     | 0.4     | 0.3     | 0.4     | 0.4      |
| 110               | 0.2     | 0.2     | 0.1     | 0.2     | 0.2      |
| 118               | 1.1     | 1.4     | 0.9     | 1.3     | 1.3      |
| 121               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 126               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 128               | 0.6     | 0.7     | 0.5     | 0.7     | 0.6      |
| 138               | 4.1     | 5.0     | 3.3     | 4.6     | 4.5      |
| 141               | 0.2     | 0.2     | 0.1     | 0.1     | 0.1      |
| 151               | 0.4     | 0.5     | 0.3     | 0.5     | 0.4      |
| 153               | 4.1     | 5.1     | 3.4     | 4.8     | 4.6      |
| 156               | 0.1     | 0.2     | 0.2     | 0.2     | 0.2      |
| 169               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 170               | 0.6     | 0.7     | 0.5     | 0.7     | 0.7      |
| 180               | 1.1     | 1.3     | 1.0     | 1.2     | 1.2      |
| 187               | 1.4     | 1.7     | 1.1     | 1.6     | 1.6      |
| 194               | 0.1     | 0.1     | < 0.1   | 0.1     | 0.1      |
| 195               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 206               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| 209               | < 0.1   | < 0.1   | < 0.1   | < 0.1   | < 0.1    |
| Total PCB         | 15.6    | 18.6    | 12.3    | 17.3    | 16.8     |

**Table 9:**

Organic contaminants in mussels from Upper Tamaki Estuary (ng/g dry weight).

| NIWA Lab Code        | OA122/11 | OA122/12 | OA122/13 | OA122/14 | OA122/15 |
|----------------------|----------|----------|----------|----------|----------|
| ARC Sample Code      | # 1      | # 2      | # 3      | # 4      | # 5      |
| Lipid Content (% DW) | 5.1      | 4.7      | 5.1      | 5.4      | 4.8      |
| PAHs                 |          |          |          |          |          |
| phenanthrene         | 5.1      | 4.1      | 3.7      | 4.2      | 4.3      |
| anthracene           | 1.0      | 0.8      | 0.7      | 0.8      | 0.9      |
| 1-methylphenanthrene | 1.9      | 1.7      | 1.6      | 1.8      | 1.6      |
| fluoranthene         | 12.3     | 10.4     | 9.9      | 10.5     | 10.7     |
| pyrene               | 15.1     | 13.6     | 13.4     | 14.2     | 13.7     |
| benz[a]anthracene    | 5.8      | 4.8      | 4.5      | 5.0      | 5.2      |
| chrysene             | 9.4      | 7.4      | 8.0      | 8.5      | 8.7      |
| benzo[b]fluoranthene | 12.3     | 10.1     | 10.6     | 11.3     | 11.4     |
| benzo[k]fluoranthene | 4.5      | 3.8      | 3.8      | 4.2      | 4.2      |
| benzo[e]pyrene       | 6.7      | 5.8      | 5.8      | 6.3      | 6.3      |
| benzo[a]pyrene       | 6.9      | 6.1      | 5.5      | 6.1      | 6.6      |
| perylene             | 16.1     | 13.9     | 14.9     | 15.9     | 15.6     |
| indeno[123-cd]pyrene | 8.5      | 7.2      | 7.4      | 7.8      | 7.8      |
| dibenz[ah]anthracene | 2.0      | 1.6      | 1.7      | 1.8      | 1.9      |
| benzo[ghi]perylene   | 10.0     | 8.5      | 9.0      | 9.3      | 9.3      |
| Total PAH            | 117.6    | 99.7     | 100.7    | 107.8    | 108.1    |
| DDTs                 |          |          |          |          |          |
| o,p'-DDE             | 0.1      | < 0.1    | 0.1      | 0.1      | < 0.1    |
| p,p'-DDE             | 2.1      | 1.5      | 1.8      | 2.0      | 2.0      |
| o,p'-DDD             | 0.5      | 0.4      | 0.5      | 0.5      | 0.4      |
| p,p'-DDD             | 1.6      | 1.3      | 1.5      | 1.6      | 1.4      |
| o,p'-DDT             | 0.2      | 0.2      | 0.3      | 0.2      | 0.2      |
| p,p'-DDT             | 0.7      | 0.7      | 0.8      | 0.7      | 0.6      |
| Total DDT            | 5.2      | 4.1      | 5.0      | 5.0      | 4.6      |
| Chlordanes           |          |          |          |          |          |
| heptachlor           | < 0.2    | < 0.2    | < 0.2    | < 0.2    | < 0.2    |
| heptachlor epoxide   | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| t-chlordane          | 0.4      | 0.3      | 0.4      | 0.4      | 0.4      |
| c-chlordane          | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| t-nonachlor          | 0.3      | 0.2      | 0.2      | 0.3      | 0.2      |
| c-nonachlor          | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |

| NIWA Lab Code     | OA122/11 | OA122/12 | OA122/13 | OA122/14 | OA122/15 |
|-------------------|----------|----------|----------|----------|----------|
| ARC Sample Code   | # 1      | # 2      | # 3      | # 4      | # 5      |
| Total Chlordane   | 1.1      | 0.9      | 1.0      | 1.1      | 1.0      |
| Other OCPs        |          |          |          |          |          |
| Hexachlorobenzene | 0.7      | 0.4      | 0.6      | 0.5      | 0.6      |
| lindane           | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| dieldrin          |          |          |          |          |          |
| PCBs              |          |          |          |          |          |
| 8                 | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 18                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 28                | 0.3      | 0.2      | 0.3      | 0.3      | 0.3      |
| 44                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 49                | 0.1      | < 0.1    | 0.1      | 0.1      | < 0.1    |
| 52                | 0.5      | 0.5      | 0.5      | 0.6      | 0.5      |
| 66                | 0.4      | 0.4      | 0.4      | 0.4      | 0.4      |
| 77                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 86                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 101               | 0.9      | 0.9      | 0.8      | 0.8      | 0.8      |
| 105               | 0.5      | 0.4      | 0.5      | 0.6      | 0.5      |
| 110               | 0.3      | 0.3      | 0.3      | 0.3      | 0.3      |
| 118               | 1.7      | 1.4      | 1.6      | 1.8      | 1.6      |
| 121               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 126               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 128               | 0.7      | 0.7      | 0.7      | 0.8      | 0.8      |
| 138               | 5.9      | 5.0      | 5.3      | 6.4      | 5.7      |
| 141               | 0.3      | 0.3      | 0.3      | 0.3      | 0.3      |
| 151               | 0.7      | 0.6      | 0.7      | 0.8      | 0.6      |
| 153               | 5.7      | 5.0      | 5.1      | 6.1      | 5.4      |
| 156               | 0.3      | 0.2      | 0.2      | 0.2      | 0.2      |
| 169               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 170               | 0.9      | 0.9      | 0.8      | 1.0      | 0.9      |
| 180               | 1.7      | 1.6      | 1.5      | 1.8      | 1.7      |
| 187               | 1.9      | 1.6      | 1.7      | 2.0      | 1.8      |
| 194               | 0.1      | 0.1      | 0.1      | 0.1      | 0.1      |
| 195               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 206               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 209               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| Total PCB         | 23.0     | 20.0     | 20.8     | 24.5     | 22.0     |

Table 10:

Organic contaminants in mussels from Mangere Inlet (ng/g dry weight).

| NIWA Lab Code        | OA122/26 | OA122/27 | OA122/28 | OA122/29 | OA122/30 |
|----------------------|----------|----------|----------|----------|----------|
| ARC Sample Code      | # 1      | # 2      | # 3      | # 4      | # 5      |
| Lipid Content (% DW) | 5.4      | 5.6      | 6.0      | 5.4      | 5.5      |
| PAHs                 |          |          |          |          |          |
| phenanthrene         | 3.0      | 2.9      | 2.9      | 2.7      | 3.0      |
| anthracene           | 0.6      | 0.4      | 0.5      | 0.4      | 0.5      |
| 1-methylphenanthrene | 1.1      | 1.1      | 1.1      | 1.1      | 1.2      |
| fluoranthene         | 5.0      | 5.0      | 4.7      | 4.5      | 5.0      |
| pyrene               | 7.9      | 7.8      | 7.7      | 7.6      | 8.1      |
| benz[a]anthracene    | 2.6      | 2.4      | 2.3      | 2.1      | 2.3      |
| chrysene             | 4.9      | 4.7      | 4.5      | 4.3      | 4.5      |
| benzo[b]fluoranthene | 5.3      | 5.3      | 4.9      | 4.7      | 4.9      |
| benzo[k]fluoranthene | 1.8      | 1.8      | 1.8      | 1.7      | 1.8      |
| benzo[e]pyrene       | 3.0      | 3.1      | 2.9      | 2.8      | 2.8      |
| benzo[a]pyrene       | 2.7      | 2.6      | 2.5      | 2.4      | 2.5      |
| perylene             | 5.4      | 6.1      | 5.0      | 4.7      | 4.9      |
| indeno[123-cd]pyrene | 3.3      | 3.1      | 2.9      | 2.7      | 2.9      |
| dibenz[ah]anthracene | 0.7      | 0.6      | 0.6      | 0.6      | 0.6      |
| benzo[ghi]perylene   | 4.6      | 4.5      | 4.2      | 3.9      | 4.0      |
| Total PAH            | 51.8     | 51.4     | 48.5     | 46.4     | 49.0     |
| DDTs                 |          |          |          |          |          |
| o,p'-DDE             | 0.7      | 0.6      | 0.7      | 0.6      | 0.6      |
| p,p'-DDE             | 8.8      | 8.6      | 9.6      | 8.2      | 9.3      |
| o,p'-DDD             | 0.3      | 0.3      | 0.3      | 0.2      | 0.3      |
| p,p'-DDD             | 1.7      | 1.7      | 1.7      | 1.6      | 1.8      |
| o,p'-DDT             | 0.1      | 0.1      | 0.2      | 0.2      | 0.2      |
| p,p'-DDT             | 0.4      | 0.3      | 0.4      | 0.4      | 0.4      |
| Total DDT            | 12.0     | 11.6     | 13.0     | 11.1     | 12.6     |
| Chlordanes           |          |          |          |          |          |
| heptachlor           | < 0.2    | < 0.2    | < 0.2    | < 0.2    | < 0.2    |
| heptachlor epoxide   | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| t-chlordane          | 0.7      | 0.7      | 0.7      | 0.6      | 0.7      |
| c-chlordane          | 0.3      | 0.3      | 0.3      | 0.3      | 0.3      |
| t-nonachlor          | 0.4      | 0.4      | 0.3      | 0.3      | 0.3      |

| NIWA Lab Code     | OA122/26 | OA122/27 | OA122/28 | OA122/29 | OA122/30 |
|-------------------|----------|----------|----------|----------|----------|
| ARC Sample Code   | # 1      | # 2      | # 3      | # 4      | # 5      |
| c-nonachlor       | 0.5      | 0.4      | 0.4      | 0.4      | 0.4      |
| Total Chlordane   | 1.9      | 1.8      | 1.8      | 1.7      | 1.8      |
| Other OCPs        |          |          |          |          |          |
| Hexachlorobenzene | 0.3      | 0.4      | 0.4      | 0.3      | 0.3      |
| lindane           | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| dieldrin          |          |          |          |          |          |
| PCBs              |          |          |          |          |          |
| 8                 | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 18                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 28                | 0.4      | 0.4      | 0.4      | 0.4      | 0.4      |
| 44                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 49                | 0.1      | 0.2      | 0.2      | 0.1      | 0.2      |
| 52                | 0.6      | 0.6      | 0.7      | 0.6      | 0.8      |
| 66                | 0.6      | 0.6      | 0.7      | 0.6      | 0.7      |
| 77                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 86                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 101               | 0.9      | 1.0      | 1.2      | 0.9      | 1.1      |
| 105               | 0.7      | 0.6      | 0.6      | 0.6      | 0.7      |
| 110               | 0.4      | 0.4      | 0.5      | 0.4      | 0.5      |
| 118               | 2.1      | 2.0      | 2.1      | 1.9      | 2.2      |
| 121               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 126               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 128               | 0.8      | 0.8      | 0.8      | 0.7      | 0.8      |
| 138               | 5.7      | 5.3      | 5.6      | 5.1      | 5.7      |
| 141               | 0.3      | 0.3      | 0.3      | 0.3      | 0.3      |
| 151               | 0.7      | 0.7      | 0.7      | 0.6      | 0.8      |
| 153               | 5.1      | 4.6      | 5.0      | 4.5      | 5.1      |
| 156               | 0.3      | 0.3      | 0.3      | 0.2      | 0.3      |
| 169               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 170               | 1.1      | 1.0      | 1.0      | 0.9      | 1.1      |
| 180               | 1.9      | 1.7      | 1.8      | 1.6      | 1.8      |
| 187               | 2.2      | 2.1      | 2.2      | 2.0      | 2.3      |
| 194               | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| 195               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 206               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 209               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| Total PCB         | 24.3     | 22.9     | 24.4     | 21.9     | 24.7     |

Table 11:

Organic contaminants in mussels from Papakura Channel (ng/g dry weight).

| NIWA Lab Code        | OA122/16 | OA122/17 | OA122/18 | OA122/19 | OA122/20 |
|----------------------|----------|----------|----------|----------|----------|
| ARC Sample Code      | # 1      | # 2      | # 3      | # 4      | # 5      |
| Lipid Content (% DW) | 5.8      | 6.0      | 5.9      | 6.2      | 5.9      |
| PAHs                 |          |          |          |          |          |
| phenanthrene         | 1.3      | 2.0      | 1.6      | 1.8      | 1.7      |
| anthracene           | 0.3      | 0.3      | 0.2      | < 0.2    | 0.2      |
| 1-methylphenanthrene | 0.5      | 0.5      | 0.5      | 0.5      | 0.5      |
| fluoranthene         | 1.7      | 2.4      | 1.7      | 1.9      | 1.8      |
| pyrene               | 1.8      | 2.5      | 1.9      | 2.1      | 2.1      |
| benz[a]anthracene    | 0.8      | 1.1      | 0.8      | 0.7      | 0.7      |
| chrysene             | 1.6      | 1.8      | 1.4      | 1.4      | 1.4      |
| benzo[b]fluoranthene | 1.6      | 1.9      | 1.6      | 1.6      | 1.5      |
| benzo[k]fluoranthene | 0.5      | 0.7      | 0.5      | 0.6      | 0.5      |
| benzo[e]pyrene       | 0.9      | 1.1      | 0.9      | 0.9      | 0.9      |
| benzo[a]pyrene       | 1.0      | 1.3      | 1.1      | 1.0      | 0.9      |
| perylene             | 2.6      | 2.6      | 2.4      | 2.6      | 2.6      |
| indeno[123-cd]pyrene | 0.9      | 1.3      | 1.2      | 1.0      | 1.0      |
| dibenz[ah]anthracene | < 0.2    | 0.2      | 0.2      | < 0.2    | < 0.2    |
| benzo[ghi]perylene   | 1.3      | 1.5      | 1.5      | 1.3      | 1.2      |
| Total PAH            | 16.7     | 21.2     | 17.4     | 17.3     | 17.0     |
| DDTs                 |          |          |          |          |          |
| o,p'-DDE             | 0.4      | 0.4      | 0.4      | 0.4      | 0.4      |
| p,p'-DDE             | 3.2      | 2.6      | 2.4      | 3.0      | 2.5      |
| o,p'-DDD             | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| p,p'-DDD             | 0.5      | 0.4      | 0.5      | 0.4      | 0.4      |
| o,p'-DDT             | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| p,p'-DDT             | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| Total DDT            | 4.4      | 3.6      | 3.5      | 4.1      | 3.5      |
| Chlordanes           |          |          |          |          |          |
| heptachlor           | < 0.2    | < 0.2    | < 0.2    | < 0.2    | < 0.2    |
| heptachlor epoxide   | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| t-chlordane          | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| c-chlordane          | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| t-nonachlor          | 0.1      | < 0.1    | < 0.1    | < 0.1    | < 0.1    |

| NIWA Lab Code     | OA122/16 | OA122/17 | OA122/18 | OA122/19 | OA122/20 |
|-------------------|----------|----------|----------|----------|----------|
| ARC Sample Code   | # 1      | # 2      | # 3      | # 4      | # 5      |
| c-nonachlor       | 0.1      | 0.1      | 0.1      | 0.1      | 0.1      |
| Total Chlordane   | 0.4      | 0.3      | 0.3      | 0.3      | 0.3      |
| Other OCPs        |          |          |          |          |          |
| Hexachlorobenzene | 0.3      | 0.2      | 0.3      | 0.2      | 0.2      |
| lindane           | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| dieldrin          |          |          |          |          |          |
| PCBs              |          |          |          |          |          |
| 8                 | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 18                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 28                | < 0.1    | < 0.1    | < 0.1    | 0.1      | < 0.1    |
| 44                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 49                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 52                | 0.1      | 0.1      | 0.1      | 0.1      | 0.1      |
| 66                | 0.1      | < 0.1    | < 0.1    | 0.2      | < 0.1    |
| 77                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 86                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 101               | 0.1      | 0.1      | 0.1      | 0.2      | 0.1      |
| 105               | 0.2      | 0.1      | 0.1      | 0.2      | 0.1      |
| 110               | < 0.1    | < 0.1    | < 0.1    | 0.1      | < 0.1    |
| 118               | 0.4      | 0.4      | 0.4      | 0.5      | 0.4      |
| 121               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 126               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 128               | 0.2      | 0.1      | 0.2      | 0.3      | 0.1      |
| 138               | 1.4      | 1.2      | 1.2      | 1.5      | 1.1      |
| 141               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 151               | 0.2      | 0.1      | 0.1      | 0.2      | 0.1      |
| 153               | 1.4      | 1.2      | 1.2      | 0.8      | 1.1      |
| 156               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 169               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 170               | 0.2      | 0.3      | 0.2      | 0.3      | 0.2      |
| 180               | 0.4      | 0.4      | 0.4      | 0.2      | 0.4      |
| 187               | 0.5      | 0.4      | 0.4      | 0.5      | 0.4      |
| 194               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 195               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 206               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 209               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| Total PCB         | 5.2      | 4.7      | 4.4      | 5.2      | 4.1      |

**Table 12:**

Organic contaminants in mussels from Upper Waitemata Harbour (ng/g dry weight).

| NIWA Lab Code        | OA122/21 | OA122/22 | OA122/23 | OA122/24 | OA122/25 |
|----------------------|----------|----------|----------|----------|----------|
| ARC Sample Code      | # 1      | # 2      | # 3      | # 4      | # 5      |
| Lipid Content (% DW) | 6.3      | 6.6      | 5.4      | 6.6      | 7.0      |
| PAHs                 |          |          |          |          |          |
| phenanthrene         | 21.4     | 3.4      | 2.9      | 3.5      | 4.1      |
| anthracene           | 3.4      | 0.6      | 0.5      | 0.5      | 0.8      |
| 1-methylphenanthrene | 8.3      | 1.2      | 1.0      | 1.3      | 1.6      |
| fluoranthene         | 13.1     | 7.6      | 6.2      | 8.2      | 9.5      |
| pyrene               | 12.0     | 8.5      | 7.1      | 9.3      | 10.4     |
| benz[a]anthracene    | 4.8      | 4.1      | 3.0      | 4.0      | 4.7      |
| chrysene             | 10.5     | 6.6      | 5.2      | 6.8      | 7.8      |
| benzo[b]fluoranthene | 10.1     | 9.2      | 7.7      | 9.7      | 11.0     |
| benzo[k]fluoranthene | 3.6      | 3.2      | 2.8      | 3.6      | 4.0      |
| benzo[e]pyrene       | 5.8      | 4.8      | 3.9      | 5.0      | 5.6      |
| benzo[a]pyrene       | 5.6      | 5.2      | 4.2      | 5.2      | 6.3      |
| perylene             | 7.8      | 7.0      | 6.1      | 7.5      | 9.0      |
| indeno[123-cd]pyrene | 6.8      | 6.5      | 5.4      | 7.1      | 7.7      |
| dibenz[ah]anthracene | 1.7      | 1.4      | 1.1      | 1.5      | 1.7      |
| benzo[ghi]perylene   | 7.5      | 7.0      | 5.8      | 7.8      | 8.4      |
| Total PAH            | 122.4    | 76.4     | 62.7     | 81.0     | 92.8     |
| DDTs                 |          |          |          |          |          |
| o,p'-DDE             | 0.3      | 0.3      | 0.2      | 0.3      | 0.3      |
| p,p'-DDE             | 5.6      | 5.2      | 3.3      | 5.4      | 6.0      |
| o,p'-DDD             | 0.8      | 0.8      | 0.6      | 0.9      | 1.0      |
| p,p'-DDD             | 2.7      | 2.7      | 2.0      | 2.8      | 3.1      |
| o,p'-DDT             | 0.2      | 0.2      | 0.2      | 0.3      | 0.3      |
| p,p'-DDT             | 1.2      | 1.1      | 0.8      | 1.3      | 1.2      |
| Total DDT            | 10.7     | 10.3     | 7.1      | 10.8     | 11.9     |
| Chlordanes           |          |          |          |          |          |
| heptachlor           | < 0.2    | < 0.2    | < 0.2    | < 0.2    | < 0.2    |
| heptachlor epoxide   | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| t-chlordane          | 0.3      | 0.3      | 0.3      | 0.3      | 0.4      |
| c-chlordane          | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| t-nonachlor          | 0.3      | 0.3      | 0.2      | 0.2      | 0.3      |

| NIWA Lab Code     | OA122/21 | OA122/22 | OA122/23 | OA122/24 | OA122/25 |
|-------------------|----------|----------|----------|----------|----------|
| ARC Sample Code   | # 1      | # 2      | # 3      | # 4      | # 5      |
| c-nonachlor       | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| Total Chlordane   | 1.0      | 1.0      | 0.8      | 1.0      | 1.1      |
| Other OCPs        |          |          |          |          |          |
| Hexachlorobenzene | 0.4      | 0.3      | 0.4      | 0.3      | 0.5      |
| lindane           | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| dieldrin          |          |          |          |          |          |
| PCBs              |          |          |          |          |          |
| 8                 | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 18                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 28                | 0.1      | < 0.1    | 0.1      | < 0.1    | 0.1      |
| 44                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 49                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 52                | 0.5      | 0.3      | 0.2      | 0.3      | 0.4      |
| 66                | 0.2      | 0.2      | 0.2      | 0.2      | 0.3      |
| 77                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 86                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 101               | 0.5      | 0.4      | 0.3      | 0.4      | 0.5      |
| 105               | 0.5      | 0.5      | 0.4      | 0.4      | 0.6      |
| 110               | 0.2      | 0.2      | 0.1      | 0.2      | 0.2      |
| 118               | 1.6      | 1.7      | 1.2      | 1.5      | 1.9      |
| 121               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 126               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 128               | 0.8      | 0.9      | 0.6      | 0.7      | 0.9      |
| 138               | 5.3      | 5.8      | 4.0      | 4.8      | 6.0      |
| 141               | 0.2      | 0.1      | < 0.1    | 0.1      | 0.2      |
| 151               | 0.5      | 0.5      | 0.4      | 0.5      | 0.6      |
| 153               | 5.0      | 5.3      | 3.9      | 4.8      | 5.9      |
| 156               | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| 169               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 170               | 0.8      | 0.9      | 0.6      | 0.7      | 0.8      |
| 180               | 1.3      | 1.5      | 1.0      | 1.2      | 1.5      |
| 187               | 1.7      | 1.8      | 1.3      | 1.5      | 2.0      |
| 194               | 0.1      | 0.1      | 0.1      | 0.1      | 0.2      |
| 195               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 206               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 209               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| Total PCB         | 19.5     | 20.5     | 14.6     | 17.6     | 22.1     |

Table 13:

Organic contaminants in mussels from Weymouth (ng/g dry weight).

| NIWA Lab Code        | OA122/31 | OA122/32 | OA122/33 | OA122/34 | OA122/35 |
|----------------------|----------|----------|----------|----------|----------|
| ARC Sample Code      | # 1      | # 2      | # 3      | # 4      | # 5      |
| Lipid Content (% DW) | 6.7      | 6.8      | 6.2      | 7.0      | 6.5      |
| PAHs                 |          |          |          |          |          |
| phenanthrene         | 2.0      | 2.9      | 8.6      | 11.9     | 4.9      |
| anthracene           | 0.2      | 0.4      | 1.2      | 1.8      | 0.7      |
| 1-methylphenanthrene | 0.7      | 0.9      | 2.8      | 3.9      | 1.5      |
| fluoranthene         | 2.1      | 2.3      | 4.4      | 5.5      | 3.0      |
| pyrene               | 2.9      | 2.8      | 4.0      | 4.9      | 3.4      |
| benz[a]anthracene    | 0.9      | 0.8      | 1.0      | 1.2      | 0.9      |
| chrysene             | 1.9      | 1.9      | 2.9      | 3.6      | 2.4      |
| benzo[b]fluoranthene | 1.9      | 1.7      | 1.9      | 1.9      | 2.0      |
| benzo[k]fluoranthene | 0.6      | 0.5      | 0.6      | 0.6      | 0.7      |
| benzo[e]pyrene       | 1.2      | 1.1      | 1.3      | 1.4      | 1.3      |
| benzo[a]pyrene       | 1.1      | 0.8      | 0.9      | 1.0      | 1.0      |
| perylene             | 2.6      | 2.4      | 2.6      | 2.5      | 2.7      |
| indeno[123-cd]pyrene | 1.0      | 1.0      | 1.0      | 1.0      | 1.3      |
| dibenz[ah]anthracene | 0.2      | 0.2      | 0.2      | 0.3      | 0.3      |
| benzo[ghi]perylene   | 1.4      | 1.4      | 1.4      | 1.4      | 1.7      |
| Total PAH            | 20.9     | 21.2     | 34.9     | 42.9     | 27.6     |
| DDTs                 |          |          |          |          |          |
| o,p'-DDE             | 0.2      | 0.2      | 0.1      | 0.2      | 0.1      |
| p,p'-DDE             | 1.7      | 1.7      | 1.6      | 1.8      | 1.5      |
| o,p'-DDD             | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| p,p'-DDD             | 0.3      | 0.3      | 0.3      | 0.4      | 0.3      |
| o,p'-DDT             | < 0.1    | < 0.1    | < 0.1    | < 0.1    | 0.1      |
| p,p'-DDT             | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| Total DDT            | 2.5      | 2.4      | 2.3      | 2.6      | 2.2      |
| Chlordanes           |          |          |          |          |          |
| heptachlor           | < 0.2    | < 0.2    | < 0.2    | < 0.2    | < 0.2    |
| heptachlor epoxide   | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| t-chlordane          | 0.1      | 0.1      | 0.1      | 0.1      | 0.1      |
| c-chlordane          | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| t-nonachlor          | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |

| NIWA Lab Code     | OA122/31 | OA122/32 | OA122/33 | OA122/34 | OA122/35 |
|-------------------|----------|----------|----------|----------|----------|
| ARC Sample Code   | # 1      | # 2      | # 3      | # 4      | # 5      |
| c-nonachlor       | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| Total Chlordane   | 0.1      | 0.1      | 0.1      | 0.1      | 0.1      |
| Other OCPs        |          |          |          |          |          |
| Hexachlorobenzene | 0.4      | 0.4      | 0.4      | 0.4      | 0.3      |
| lindane           | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| dieldrin          |          |          |          |          |          |
| PCBs              |          |          |          |          |          |
| 8                 | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 18                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 28                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 44                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 49                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 52                | 0.1      | 0.1      | 0.2      | 0.2      | 0.1      |
| 66                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 77                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 86                | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 101               | 0.1      | 0.1      | 0.1      | 0.1      | < 0.1    |
| 105               | 0.1      | < 0.1    | 0.1      | 0.1      | < 0.1    |
| 110               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 118               | 0.3      | 0.3      | 0.3      | 0.4      | 0.3      |
| 121               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 126               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 128               | 0.1      | 0.2      | 0.2      | 0.2      | 0.2      |
| 138               | 1.1      | 1.2      | 1.1      | 1.3      | 1.2      |
| 141               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 151               | 0.1      | 0.1      | 0.1      | 0.1      | 0.1      |
| 153               | 1.2      | 1.2      | 1.2      | 1.3      | 1.2      |
| 156               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 169               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 170               | 0.2      | 0.2      | 0.2      | 0.2      | 0.2      |
| 180               | 0.4      | 0.4      | 0.4      | 0.4      | 0.4      |
| 187               | 0.4      | 0.4      | 0.4      | 0.4      | 0.4      |
| 194               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 195               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 206               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| 209               | < 0.1    | < 0.1    | < 0.1    | < 0.1    | < 0.1    |
| Total PCB         | 4.1      | 4.2      | 4.2      | 4.7      | 4.1      |

**Table 14:**

Organic contaminants in mussels predeployment (ng/g dry weight).

| NIWA Lab Code        | OA122/36      |
|----------------------|---------------|
| ARC Sample Code      | Predeployment |
| Lipid Content (% DW) | 5.7           |
| PAHs                 |               |
| phenanthrene         | 5.4           |
| anthracene           | 0.5           |
| 1-methylphenanthrene | 1.8           |
| fluoranthene         | 2.4           |
| pyrene               | 2.2           |
| benz[a]anthracene    | 0.5           |
| chrysene             | 1.8           |
| benzo[b]fluoranthene | 0.7           |
| benzo[k]fluoranthene | < 0.2         |
| benzo[e]pyrene       | 0.5           |
| benzo[a]pyrene       | 0.4           |
| perylene             | < 0.2         |
| indeno[123-cd]pyrene | 0.3           |
| dibenz[ah]anthracene | < 0.2         |
| benzo[ghi]perylene   | 0.4           |
| Total PAH            | 16.9          |
| DDTs                 |               |
| o,p'-DDE             | < 0.1         |
| p,p'-DDE             | < 0.1         |
| o,p'-DDD             | < 0.1         |
| p,p'-DDD             | 0.1           |
| o,p'-DDT             | < 0.1         |
| p,p'-DDT             | < 0.1         |
| Total DDT            | <0.3          |
| Chlordanes           |               |
| heptachlor           | < 0.2         |
| heptachlor epoxide   | < 0.1         |
| t-chlordane          | < 0.1         |
| c-chlordane          | < 0.1         |
| t-nonachlor          | < 0.1         |

|                   |               |
|-------------------|---------------|
| NIWA Lab Code     | OA122/36      |
| ARC Sample Code   | Predeployment |
| c-nonachlor       | < 0.1         |
| Total Chlordane   | <0.3          |
| Other OCPs        |               |
| Hexachlorobenzene | 0.2           |
| lindane           | < 0.1         |
| dieldrin          |               |
| PCBs              |               |
| 8                 | < 0.1         |
| 18                | < 0.1         |
| 28                | < 0.1         |
| 44                | < 0.1         |
| 49                | < 0.1         |
| 52                | < 0.1         |
| 66                | < 0.1         |
| 77                | < 0.1         |
| 86                | < 0.1         |
| 101               | < 0.1         |
| 105               | < 0.1         |
| 110               | < 0.1         |
| 118               | < 0.1         |
| 121               | < 0.1         |
| 126               | < 0.1         |
| 128               | < 0.1         |
| 138               | 0.2           |
| 141               | < 0.1         |
| 151               | < 0.1         |
| 153               | 0.2           |
| 156               | < 0.1         |
| 169               | < 0.1         |
| 170               | < 0.1         |
| 180               | < 0.1         |
| 187               | < 0.1         |
| 194               | < 0.1         |
| 195               | < 0.1         |
| 206               | < 0.1         |
| 209               | < 0.1         |
| Total PCB         | <2.0          |

**Table 15:**

Organic contaminants in mussel composites (ng/g dry weight).

| NIWA Lab Code        | OA122/Comp<br>1 | OA122/Comp<br>2 | OA122/Comp<br>3 |
|----------------------|-----------------|-----------------|-----------------|
| ARC Sample Code      |                 |                 |                 |
| Lipid Content (% DW) | 6.9             | 7.5             | 7.3             |
| PAHs                 |                 |                 |                 |
| phenanthrene         | 3.9             | 4.0             | 3.7             |
| anthracene           | 0.7             | 0.7             | 0.7             |
| 1-methylphenanthrene | 1.2             | 1.2             | 1.1             |
| fluoranthene         | 5.5             | 5.9             | 5.7             |
| pyrene               | 5.4             | 6.0             | 5.7             |
| benz[a]anthracene    | 2.5             | 2.8             | 2.7             |
| chrysene             | 4.3             | 4.6             | 4.4             |
| benzo[b]fluoranthene | 5.4             | 5.9             | 5.5             |
| benzo[k]fluoranthene | 2.0             | 2.2             | 2.0             |
| benzo[e]pyrene       | 2.7             | 2.9             | 2.7             |
| benzo[a]pyrene       | 3.1             | 3.5             | 3.4             |
| perylene             | 2.0             | 2.2             | 2.2             |
| indeno[123-cd]pyrene | 3.8             | 4.2             | 4.0             |
| dibenz[ah]anthracene | 0.8             | 0.9             | 0.9             |
| benzo[ghi]perylene   | 3.9             | 4.2             | 4.1             |
| Total PAH            | 47.3            | 51.3            | 48.9            |
| DDTs                 |                 |                 |                 |
| o,p'-DDE             | 0.3             | 0.3             | 0.2             |
| p,p'-DDE             | 1.6             | 1.6             | 1.4             |
| o,p'-DDD             | 0.8             | 0.7             | 0.7             |
| p,p'-DDD             | 1.9             | 1.9             | 1.8             |
| o,p'-DDT             | 0.4             | 0.4             | 0.4             |
| p,p'-DDT             | 1.7             | 1.7             | 1.6             |
| Total DDT            | 6.7             | 6.7             | 6.1             |
| Chlordanes           |                 |                 |                 |
| heptachlor           | < 0.2           | < 0.2           | < 0.2           |
| heptachlor epoxide   | < 0.1           | < 0.1           | < 0.1           |
| t-chlordane          | 0.2             | 0.2             | 0.2             |
| c-chlordane          | 0.1             | 0.1             | 0.1             |
| t-nonachlor          | 0.2             | 0.2             | 0.2             |
| c-nonachlor          | 0.1             | 0.1             | 0.1             |

| NIWA Lab Code          | OA122/Comp<br>1 | OA122/Comp<br>2 | OA122/Comp<br>3 |
|------------------------|-----------------|-----------------|-----------------|
| <b>ARC Sample Code</b> |                 |                 |                 |
| Total Chlordane        | 0.6             | 0.6             | 0.6             |
| Other OCPs             |                 |                 |                 |
| Hexachlorobenzene      | 0.3             | 0.3             | 0.3             |
| lindane                | < 0.1           | < 0.1           | < 0.1           |
| dieldrin               |                 |                 |                 |
| PCBs                   |                 |                 |                 |
| 8                      | < 0.1           | < 0.1           | < 0.1           |
| 18                     | < 0.1           | < 0.1           | < 0.1           |
| 28                     | < 0.1           | < 0.1           | < 0.1           |
| 44                     | < 0.1           | < 0.1           | < 0.1           |
| 49                     | < 0.1           | < 0.1           | < 0.1           |
| 52                     | 0.2             | 0.2             | 0.2             |
| 66                     | 0.1             | 0.1             | 0.2             |
| 77                     | < 0.1           | < 0.1           | < 0.1           |
| 86                     | < 0.1           | < 0.1           | < 0.1           |
| 101                    | 0.3             | 0.3             | 0.3             |
| 105                    | 0.2             | 0.2             | 0.2             |
| 110                    | 0.1             | 0.1             | 0.1             |
| 118                    | 0.8             | 0.8             | 0.7             |
| 121                    | < 0.1           | < 0.1           | < 0.1           |
| 126                    | < 0.1           | < 0.1           | < 0.1           |
| 128                    | 0.4             | 0.4             | 0.3             |
| 138                    | 3.0             | 2.9             | 2.7             |
| 141                    | < 0.1           | < 0.1           | < 0.1           |
| 151                    | 0.3             | 0.3             | 0.3             |
| 153                    | 3.4             | 3.3             | 3.0             |
| 156                    | < 0.1           | < 0.1           | < 0.1           |
| 169                    | < 0.1           | < 0.1           | < 0.1           |
| 170                    | 0.4             | 0.5             | 0.4             |
| 180                    | 0.9             | 0.9             | 0.8             |
| 187                    | 0.8             | 0.8             | 0.7             |
| 194                    | 0.1             | 0.1             | < 0.1           |
| 195                    | < 0.1           | < 0.1           | < 0.1           |
| 206                    | < 0.1           | < 0.1           | < 0.1           |
| 209                    | < 0.1           | < 0.1           | < 0.1           |
| Total PCB              | 11.0            | 10.9            | 10.0            |

**Table 16:**

Organic contaminants in archived mussel and oyster samples from 2003 (ng/g dry weight).

| NIWA Lab Code        | OA92/15 | OA92/15 | OA93/13 | OA93/13 |
|----------------------|---------|---------|---------|---------|
| Year analysed        | 2003    | 2006    | 2003    | 2006    |
| Lipid Content (% DW) | 10.1    | 9.2     | 6.4     | 6.4     |
| PAHs                 |         |         |         |         |
| phenanthrene         | 2.5     | 2.8     | 2.6     | 3.6     |
| anthracene           | 1.0     | 0.3     | 1.3     | 0.7     |
| 1-methylphenanthrene | 2.3     | 2.7     | 1.1     | 1.4     |
| fluoranthene         | 13.3    | 11.9    | 7.8     | 8.0     |
| pyrene               | 20.2    | 16.8    | 12.5    | 11.3    |
| benz[a]anthracene    | 4.2     | 1.8     | 3.9     | 3.6     |
| chrysene             | 10.0    | 10.7    | 7.1     | 7.4     |
| benzo[b]fluoranthene | 5.0     | 6.0     | 6.5     | 10.2    |
| benzo[k]fluoranthene | 2.6     | 1.8     | 5.1     | 3.7     |
| benzo[e]pyrene       | 4.8     | 5.1     | 4.7     | 5.6     |
| benzo[a]pyrene       | 1.4     | 0.5     | 4.5     | 3.6     |
| perylene             | 4.4     | 2.0     | 11.3    | 10.1    |
| indeno[123-cd]pyrene | 1.2     | 1.6     | 4.2     | 6.2     |
| dibenz[ah]anthracene | 0.4     | 0.6     | 1.0     | 1.3     |
| benzo[ghi]perylene   | 2.0     | 2.6     | 5.9     | 7.8     |
| Total PAH            | 75.3    | 67.2    | 79.6    | 84.7    |
| DDTs                 |         |         |         |         |
| o,p'-DDE             | 2.0     | 2.2     | 0.2     | 0.2     |
| p,p'-DDE             | 59.8    | 68.1    | 3.0     | 3.1     |
| o,p'-DDD             | 0.8     | 1.0     | 0.7     | 0.8     |
| p,p'-DDD             | 5.0     | 4.6     | 2.7     | 2.3     |
| o,p'-DDT             | < 0.1   | < 0.1   | 0.2     | 0.2     |
| p,p'-DDT             | 0.7     | 0.7     | 0.7     | 0.7     |
| Total DDT            | 68.3    | 76.5    | 7.5     | 7.2     |
| Chlordanes           |         |         |         |         |
| heptachlor           | < 0.2   | < 0.2   | < 0.1   | < 0.2   |
| heptachlor epoxide   | 0.2     | < 0.1   | 0.2     | < 0.1   |
| t-chlordane          | 1.4     | 1.5     | 0.2     | 0.3     |
| c-chlordane          | 1.3     | 1.3     | 0.3     | 0.3     |
| t-nonachlor          | 1.4     | 1.5     | 0.4     | 0.4     |

| NIWA Lab Code     | OA92/15 | OA92/15 | OA93/13 | OA93/13 |
|-------------------|---------|---------|---------|---------|
| Year analysed     | 2003    | 2006    | 2003    | 2006    |
| c-nonachlor       | 1.7     | 2.0     | 0.3     | 0.3     |
| Total Chlordane   | 6.0     | 6.3     | 1.4     | 1.4     |
| Other OCPs        |         |         |         |         |
| Hexachlorobenzene | < 0.1   | < 0.1   |         | 0.2     |
| lindane           | < 0.1   | < 0.1   | < 0.1   | < 0.1   |
| dieldrin          |         |         |         |         |
| PCBs              |         |         |         |         |
| 8                 | <0.1    | < 0.1   | < 0.1   | < 0.1   |
| 18                | <0.1    | < 0.1   | < 0.1   | < 0.1   |
| 28                | 0.7     | 0.4     | 0.3     | 0.2     |
| 44                | 0.8     | 0.8     | < 0.1   | < 0.1   |
| 49                | 0.9     | 1.0     | 0.1     | 0.1     |
| 52                | 2.0     | 2.0     | 0.7     | 0.5     |
| 66                | 1.3     | 1.4     | 0.5     | 0.4     |
| 77                | 0.2     | 0.2     | < 0.1   | < 0.1   |
| 86                | <0.1    | < 0.1   | < 0.1   | < 0.1   |
| 101               | 6.1     | 6.0     | 1.4     | 1.3     |
| 105               | 1.2     | 1.3     | 0.6     | 0.7     |
| 110               | 4.2     | 4.7     | 0.4     | 0.4     |
| 118               | 5.1     | 5.1     | 2.4     | 2.4     |
| 121               | <0.1    | < 0.1   | < 0.1   | < 0.1   |
| 126               | 0.2     | < 0.1   | < 0.1   | < 0.1   |
| 128               | 0.8     | 0.9     | 1.1     | 1.0     |
| 138               | 9.3     | 9.3     | 7.6     | 8.0     |
| 141               | 0.5     | 0.5     | 0.4     | 0.4     |
| 151               | 1.9     | 1.8     | 1.1     | 1.0     |
| 153               | 12.0    | 13.0    | 7.9     | 7.7     |
| 156               | 0.3     | 0.3     | 0.2     | 0.3     |
| 169               | <0.1    | < 0.1   | < 0.1   | < 0.1   |
| 170               | 0.2     | 0.2     | 1.3     | 1.2     |
| 180               | 0.9     | 1.0     | 2.1     | 2.3     |
| 187               | 3.1     | 2.8     | 2.2     | 2.4     |
| 194               | 0.2     | < 0.1   | 0.2     | 0.2     |
| 195               | <0.1    | < 0.1   | < 0.1   | < 0.1   |
| 206               | <0.1    | < 0.1   | < 0.1   | < 0.1   |
| 209               | <0.1    | < 0.1   | < 0.1   | < 0.1   |
| Total PCB         | 51.9    | 52.6    | 30.5    | 30.7    |

**Table 17:**

Organic contaminants in archived mussel and oyster samples from 2005 (ng/g dry weight).

| NIWA Lab Code        | OA115/8 | OA115/10 | OA114/18 | OA114/19 |
|----------------------|---------|----------|----------|----------|
| Year analysed        | 2005    | 2006     | 2005     | 2006     |
| Lipid Content (% DW) | 10.5    | 9.6      | 7.0      | 6.6      |
| PAHs                 |         |          |          |          |
| phenanthrene         | 1.7     | 2.1      | 1.1      | 1.9      |
| anthracene           | <0.2    | < 0.2    | <0.2     | < 0.2    |
| 1-methylphenanthrene | 1.0     | 1.2      | 0.3      | 0.4      |
| fluoranthene         | 3.1     | 3.0      | 1.0      | 1.2      |
| pyrene               | 2.6     | 2.6      | 1.1      | 1.3      |
| benz[a]anthracene    | 0.7     | 0.6      | 0.3      | 0.4      |
| chrysene             | 2.2     | 2.6      | 0.9      | 0.9      |
| benzo[b]fluoranthene | 1.5     | 1.9      | 0.6      | 0.9      |
| benzo[k]fluoranthene | 0.7     | 0.5      | 0.5      | 0.3      |
| benzo[e]pyrene       | 1.2     | 1.3      | 0.5      | 0.5      |
| benzo[a]pyrene       | 0.3     | 0.3      | 0.4      | 0.5      |
| perylene             | 1.7     | 1.1      | 1.6      | 1.7      |
| indeno[123-cd]pyrene | 0.4     | 0.4      | 0.6      | 0.6      |
| dibenz[ah]anthracene | <0.2    | < 0.2    | <0.2     | < 0.2    |
| benzo[ghi]perylene   | 0.6     | 0.7      | 0.7      | 0.7      |
| Total PAH            | 17.7    | 18.2     | 9.6      | 11.4     |
| DDTs                 |         |          |          |          |
| o,p'-DDE             | 0.2     | 0.5      | 0.2      | 0.3      |
| p,p'-DDE             | 7.5     | 6.6      | 3.1      | 2.8      |
| o,p'-DDD             | 0.2     | 0.1      | < 0.1    | < 0.1    |
| p,p'-DDD             | 1.0     | 1.0      | 0.5      | 0.5      |
| o,p'-DDT             | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| p,p'-DDT             | 0.2     | 0.2      | 0.3      | 0.2      |
| Total DDT            | 9.1     | 8.5      | 4.1      | 3.8      |
| Chlordanes           |         |          |          |          |
| heptachlor           | < 0.2   | < 0.2    | < 0.2    | < 0.2    |
| heptachlor epoxide   | < 0.2   | < 0.1    | < 0.1    | < 0.1    |
| t-chlordane          | 0.5     | 0.3      | 0.1      | 0.1      |
| c-chlordane          | 0.5     | 0.2      | 0.1      | < 0.1    |
| t-nonachlor          | 0.6     | 0.2      | 0.1      | 0.1      |

| NIWA Lab Code     | OA115/8 | OA115/10 | OA114/18 | OA114/19 |
|-------------------|---------|----------|----------|----------|
| Year analysed     | 2005    | 2006     | 2005     | 2006     |
| c-nonachlor       | 0.7     | 0.3      | 0.2      | 0.2      |
| Total Chlordane   | 2.3     | 0.9      | 0.5      | 0.4      |
| Other OCPs        |         |          |          |          |
| Hexachlorobenzene |         | < 0.1    |          | 0.3      |
| lindane           | < 0.1   | < 0.1    | < 0.1    | < 0.1    |
| dieldrin          |         |          |          |          |
| PCBs              |         |          |          |          |
| 8                 | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 18                | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 28                | < 0.1   | 0.1      | < 0.1    | < 0.1    |
| 44                | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 49                | 0.1     | < 0.1    | < 0.1    | < 0.1    |
| 52                | 0.2     | 0.2      | 0.2      | 0.1      |
| 66                | 0.2     | 0.2      | 0.2      | < 0.1    |
| 77                | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 86                | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 101               | 0.9     | 0.7      | 0.2      | 0.2      |
| 105               | 0.2     | 0.2      | 0.2      | 0.2      |
| 110               | 0.5     | 0.5      | < 0.1    | < 0.1    |
| 118               | 0.8     | 0.7      | 0.5      | 0.5      |
| 121               | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 126               | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 128               | 0.2     | 0.2      | 0.3      | 0.2      |
| 138               | 1.9     | 1.5      | 1.7      | 1.6      |
| 141               | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 151               | 0.3     | 0.2      | 0.2      | 0.2      |
| 153               | 2.5     | 2.2      | 1.7      | 1.6      |
| 156               | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 169               | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 170               | <0.1    | < 0.1    | 0.3      | 0.3      |
| 180               | 0.2     | 0.2      | 0.4      | 0.5      |
| 187               | 0.7     | 0.6      | 0.6      | 0.5      |
| 194               | <0.1    | < 0.1    | 0.1      | < 0.1    |
| 195               | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 206               | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| 209               | <0.1    | < 0.1    | < 0.1    | < 0.1    |
| Total PCB         | 8.7     | 7.7      | 6.6      | 5.7      |

### 3 Analytical Procedures

The shellfish were thawed, shucked, homogenised, then freeze-dried. Sub-samples were spiked with analytical surrogates representative of each class of compounds and extracted with dichloromethane (DCM) using Accelerated Solvent Extraction (ASE). A combination of silica/alumina, gel permeation, and silica gel chromatography was used to clean up and fractionate the extracts. Internal standards were added to all extracts before GC analysis.

The lipid content of each sample was determined gravimetrically from a measured aliquot of the original ASE extract.

Quantitative analysis of PAHs and PCBs was carried out by capillary gas chromatography using mass selective detection in selected ion mode (GC–MS–SIM).

Concentrations have been corrected for surrogate recovery. Detection limits were approximately 0.1–0.5 ng/g dry weight. In this report, the data "less than detection limit" (given as "< " values in tables) have been assigned values of 0 ng/g for calculation of compound class totals and means. The totals listed are therefore slightly lower than "true" values, but this has no practical effect on the meaning or interpretation of the data.

## 4 Quality Assurance

QA assessment was carried out by:

- Triplicate analysis of a composite mussel sample. Results are presented in Table 15 and summarised in Table A1.
- Monitoring of surrogate recoveries for both oysters and mussels. These are summarised in Tables A2 and A3.
- Collecting data for blanks and two archived samples from both 2003 or 2005. Data for archived samples are presented in Tables 16 and 17.

**Table A1:**

Triplicate analysis of composite mussel tissue (ng/g, except lipid in %).

| Analyte          | Mean | cv (%) |
|------------------|------|--------|
| Lipid (%)        | 7.2  | 4.2    |
| Total PAHs       | 49   | 4.1    |
| Total DDTs       | 6.5  | 5.2    |
| Total Chlordanes | 0.6  | 4.8    |
| Total PCBs       | 10.6 | 5.3    |

**Table A2:**

Summary of surrogate percentage recoveries for oysters.

| Surrogate             | Mean (%) | cv (%) |
|-----------------------|----------|--------|
| phenanthrene-d10      | 89.9     | 8.5    |
| Fluoranthene-d10      | 97.6     | 7.8    |
| pyrene-d10            | 96.4     | 8.0    |
| benz[a]anthracene-d12 | 90.9     | 8.0    |
| perylene-d12          | 68.8     | 14     |
| PCB103                | 96.1     | 8.2    |
| PCB207                | 95.2     | 12     |

**Table A3:**

Summary of surrogate percentage recoveries for mussels.

| Surrogate             | Mean (%) | cv (%) |
|-----------------------|----------|--------|
| phenanthrene-d10      | 88.2     | 8.5    |
| Fluoranthene-d10      | 94.7     | 6.3    |
| pyrene-d10            | 94.9     | 6.9    |
| benz[a]anthracene-d12 | 91.3     | 6.4    |
| perylene-d12          | 80.9     | 6.3    |
| PCB103                | 92.8     | 4.7    |
| PCB207                | 92.7     | 8.7    |