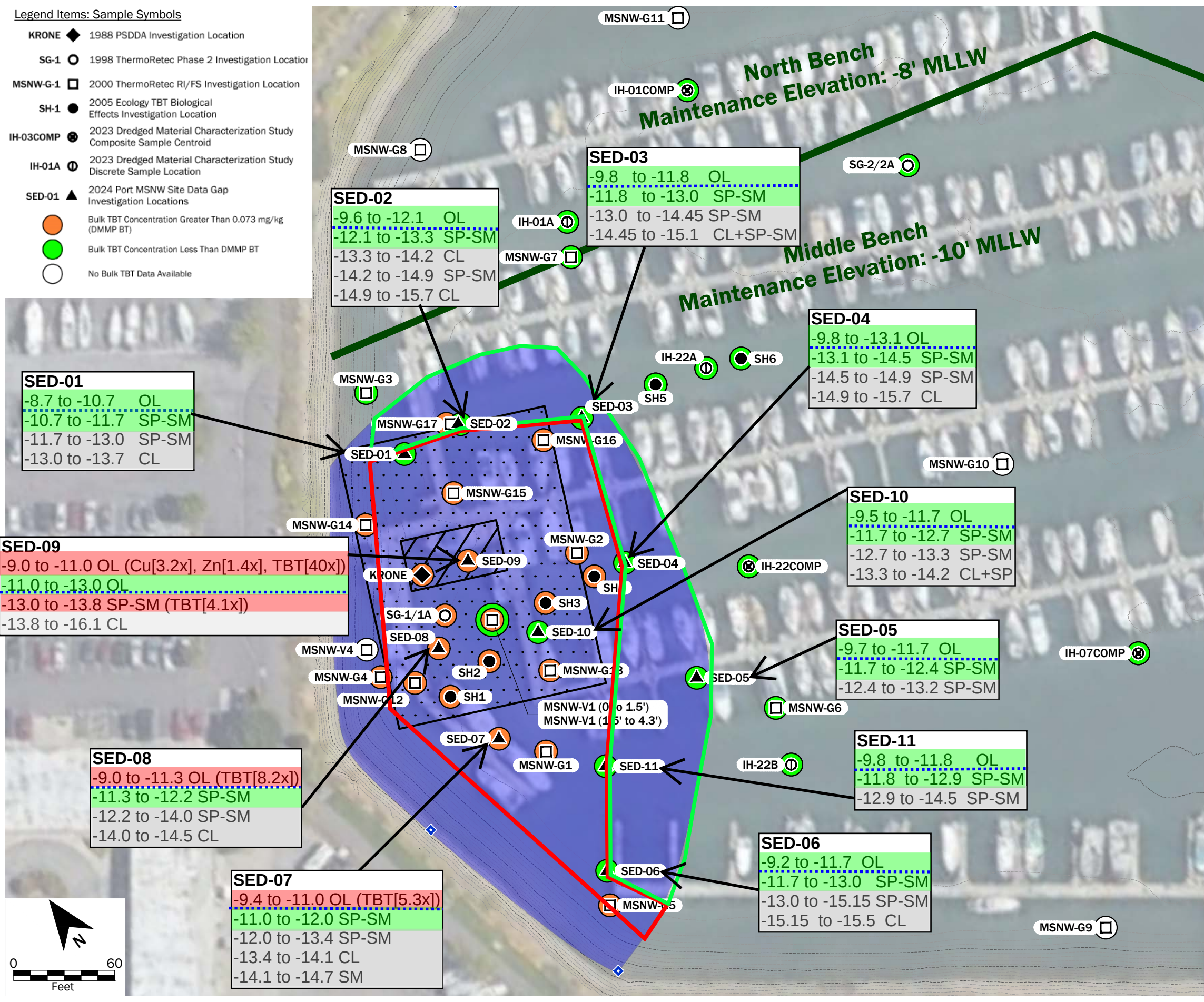


\\geoengineers.com\WAN\Projects\0307032\CAD\02\Data Gaps Work Plan\030703202\_F05\_Bulk Tributyltin (TBT) Conditions Based on Previous Investigations.dwg 5 Date Exported: 2/6/2025 10:08 AM - by Michael R. Woods



**Bulk Tributyltin (TBT) Results Based on Previous Investigations**

Marine Service NW Site  
Bellingham, Washington

**GEOENGINEERS**

Figure 5

DRAFT

Table 1  
Marine Services Northwest Physical and Chemical Analytical Results<sup>1</sup>  
MSNW Independent Cleanup  
Bellingham, Washington

| Chemical Analysis                                  | MTCA Site Cleanup Levels | Sample Location            | SED-01        |               |                    |               |                |               | SED-02        |               |                    |               |                |               | SED-03        |               |                |               | SED-04        |               |                |               | SED-05        |               |                |               |
|----------------------------------------------------|--------------------------|----------------------------|---------------|---------------|--------------------|---------------|----------------|---------------|---------------|---------------|--------------------|---------------|----------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|----------------|---------------|
|                                                    |                          | Sample Identification      | SED-01_C1     |               | SED-01_C1 (DUP-01) |               | SED-01_C2      |               | SED-02_C1     |               | SED-02_C1 (DUP-02) |               | SED-02_C2      |               | SED-03_C1     |               | SED-03_C2      |               | SED-04_C1     |               | SED-04_C2      |               | SED-05_C1     |               | SED-05_C2      |               |
|                                                    |                          | Sample Depth (ft MLLW bml) | -8.7 to -10.7 | Lab Qualifier | -8.7 to -10.7      | Lab Qualifier | -10.7 to -11.7 | Lab Qualifier | -9.6 to -12.1 | Lab Qualifier | -9.6 to -12.1      | Lab Qualifier | -12.1 to -13.3 | Lab Qualifier | -9.8 to -11.8 | Lab Qualifier | -11.8 to -13.0 | Lab Qualifier | -9.8 to -13.1 | Lab Qualifier | -13.1 to -14.5 | Lab Qualifier | -9.7 to -11.7 | Lab Qualifier | -11.7 to -12.4 | Lab Qualifier |
|                                                    |                          | Sample Date                | 11/20/24      |               | 11/20/24           |               | 11/20/24       |               | 11/20/24      |               | 11/20/24           |               | 11/20/24       |               | 11/20/24      |               | 11/20/24       |               | 11/21/24      |               | 11/21/24       |               | 11/19/24      |               | 11/19/24       |               |
|                                                    |                          | Sediment Type              | OL            |               | OL                 |               | SP-SM          |               | OL            |               | OL                 |               | SP-SM          |               | OL            |               | SP-SM          |               | OL            |               | SP-SM          |               | OL            |               | SP-SM          |               |
|                                                    |                          | Sample Type                | Discrete      |               | Duplicate          |               | Discrete       |               | Discrete      |               | Duplicate          |               | Discrete       |               | Discrete      |               | Discrete       |               | Discrete      |               | Discrete       |               | Discrete      |               | Discrete       |               |
|                                                    |                          |                            |               |               |                    |               |                |               |               |               |                    |               |                |               |               |               |                |               |               |               |                |               |               |               |                |               |
| Conventionals                                      |                          |                            |               |               |                    |               |                |               |               |               |                    |               |                |               |               |               |                |               |               |               |                |               |               |               |                |               |
| Total Organic Carbon                               | NE                       | %                          | 1.61          |               | 3.01               |               | 1.16           |               | 1.48          |               | 1.52               |               | 4.77           |               | 2.50          |               | 2.66           |               | 0.76          |               | 5.45           |               | 1.13          |               | 1.25           |               |
| Total Volatile Solids                              | NE                       | %                          | 5.80          |               | 5.85               |               | 2.45           |               | 21.37         |               | 8.69               |               | 8.11           |               | 16.49         |               | 4.28           |               | 7.38          |               | 5.31           |               | 4.66          |               | 4.58           |               |
| Total Solids                                       | NE                       | %                          | 48.21         |               | 51.54              |               | 78.87          |               | 78.44         |               | 59.86              |               | 55.09          |               | 83.60         |               | 54.91          |               | 65.79         |               | 53.47          |               | 56.38         |               | 57.76          |               |
| Metals (dry weight) <sup>2</sup>                   |                          |                            |               |               |                    |               |                |               |               |               |                    |               |                |               |               |               |                |               |               |               |                |               |               |               |                |               |
| Copper                                             | 390                      | mg/kg                      | 99.3          |               | 75.5               |               | 32.4           |               | 47.4          |               | 49.0               |               | 34.7           |               | 36.4          |               | 23.3           |               | 42.4          |               | 29.2           |               | 66.8          |               | 45.5           |               |
| Mercury                                            | 0.41                     | mg/kg                      | 0.281         |               | 0.235              |               | 0.0605         |               | 0.190         |               | 0.175              |               | 0.0734         |               | 0.147         |               | 0.101          |               | 0.150         |               | 0.111          |               | 0.235         |               | 0.180          |               |
| Zinc                                               | 410                      | mg/kg                      | 148           |               | 122                |               | 57.8           |               | 66.2          |               | 75.6               |               | 61.0           |               | 58.5          |               | 53.6           |               | 69.1          |               | 57.6           |               | 111           |               | 78.8           |               |
| Organometallic Compounds (dry weight) <sup>3</sup> |                          |                            |               |               |                    |               |                |               |               |               |                    |               |                |               |               |               |                |               |               |               |                |               |               |               |                |               |
| Tributyltin Ion                                    | 73                       | µg/kg                      | 26.8          |               | 40.6               |               | 4.09           |               | 11.4          |               | 71.5               |               | 3.85           | U             | 20.6          |               | 3.84           | U             | 6.95          |               | 3.83           | U             | 10.9          |               | 8.09           |               |

Notes:

<sup>1</sup> Chemical analytical results presented are unvalidated. Data validation is currently in progress.

<sup>2</sup> Sediment Cleanup Objectives (SCO) used for screening of metals from Sediment Management Standards Table 8-1 in the Sediment Cleanup User Manual (SCUM 2021).

<sup>3</sup> Dredged Material Management Program (DMMP) marine guideline screening values referenced from Table 8-3 of the Dredged Material Evaluation and Disposal Procedures User Manual (USACE 2021).

-- = not analyzed

µg/kg = microgram per kilogram

bml = below mudline

ft = feet

mg/kg = milligram per kilogram

MLLW = Mean Lower-Low Water

NE = not established

ng/kg = nanogram per kilogram

Sediment Type Description:

CL = Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays

SP-SM = Poorly -graded sands, gravelly sand to silty sands, sand-silt mixtures

OL = Organic silts and organic silty clays of low plasticity

Laboratory/Validated Qualifier:

D = The reported value is from a dilution

U = The analyte was not detected at a concentration greater than the value identified.

**Bold font type** indicates the analyte was detected at the reported concentration.

  Red shading indicates exceedance of MTCA Site Cleanup Levels.

**Table 1**  
**Marine Services Northwest Physical and Chemical Analytical Results<sup>1</sup>**  
MSNW Independent Cleanup  
Bellingham, Washington

|                                                    | MTCA Site Cleanup Levels | Sample Location            | SED-06        |               |                |               | SED-07        |               |                |               | SED-08        |               |                |               | SED-09A       |               |                |               |                |               |                |               | SED-10        |               |                |               | SED-11        |               |                |               |          |          |          |          |          |          |          |          |          |          |
|----------------------------------------------------|--------------------------|----------------------------|---------------|---------------|----------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|---------------|---------------|----------------|---------------|---------------|---------------|----------------|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                                                    |                          | Sample Identification      | SED-06_C1     |               | SED-06_C2      |               | SED-07_C1     |               | SED-07_C2      |               | SED-08_C1     |               | SED-08_C2      |               | SED-09A_C1    |               | SED-09A_C2     |               | SED-09A_C3     |               | SED-09A_C4     |               | SED-10_C1     |               | SED-10_C2      |               | SED-11_C1     |               | SED-11_C2      |               |          |          |          |          |          |          |          |          |          |          |
|                                                    |                          | Sample Depth (ft MLLW bml) | -9.2 to -11.7 | Lab Qualifier | -11.7 to -13.0 | Lab Qualifier | -9.4 to -11.0 | Lab Qualifier | -11.0 to -12.0 | Lab Qualifier | -9.0 to -11.3 | Lab Qualifier | -11.3 to -12.2 | Lab Qualifier | -9.0 to -11.0 | Lab Qualifier | -11.0 to -13.0 | Lab Qualifier | -13.0 to -13.8 | Lab Qualifier | -13.8 to -16.1 | Lab Qualifier | -9.5 to -11.7 | Lab Qualifier | -11.7 to -12.7 | Lab Qualifier | -9.8 to -11.8 | Lab Qualifier | -11.8 to -12.9 | Lab Qualifier |          |          |          |          |          |          |          |          |          |          |
|                                                    |                          | Sample Date                | 11/19/24      |               | 11/19/24       |               | 11/20/24      |               | 11/20/24       |               | 11/21/24      |               | 11/21/24       |               | 11/21/24      |               | 11/21/24       |               | 11/21/24       |               | 11/20/24       |               | 11/20/24      |               | 11/19/24       |               | 11/19/24      |               |                |               |          |          |          |          |          |          |          |          |          |          |
|                                                    |                          | Sediment Type              | OL            |               | SP-SM          |               | OL            |               | SP-SM          |               | OL            |               | SP-SM          |               | OL            |               | OL             |               | SP-SM          |               | CL             |               | OL            |               | SP-SM          |               | OL            |               | SP-SM          |               |          |          |          |          |          |          |          |          |          |          |
|                                                    |                          | Sample Type                | Discrete      |               | Discrete       |               | Discrete      |               | Discrete       |               | Discrete      |               | Discrete       |               | Discrete      |               | Discrete       |               | Discrete       |               | Discrete       |               | Discrete      |               | Discrete       |               | Discrete      |               | Discrete       |               | Discrete | Discrete | Discrete | Discrete | Discrete | Discrete | Discrete | Discrete | Discrete | Discrete |
|                                                    |                          |                            |               |               |                |               |               |               |                |               |               |               |                |               |               |               |                |               |                |               |                |               |               |               |                |               |               |               |                |               |          |          |          |          |          |          |          |          |          |          |
| Conventionals                                      |                          |                            |               |               |                |               |               |               |                |               |               |               |                |               |               |               |                |               |                |               |                |               |               |               |                |               |               |               |                |               |          |          |          |          |          |          |          |          |          |          |
| Total Organic Carbon                               | NE                       | %                          | 0.96          |               | 0.49           |               | 1.70          |               | 2.28           |               | 1.67          |               | 4.57           |               | 1.45          |               | 1.20           |               | 1.11           |               | 0.66           |               | 1.38          |               | 2.49           |               | 1.97          |               | 0.44           |               |          |          |          |          |          |          |          |          |          |          |
| Total Volatile Solids                              | NE                       | %                          | 2.64          |               | 5.22           |               | 5.42          |               | 4.46           |               | 6.15          |               | 8.02           |               | 5.79          |               | 8.27           |               | 6.04           |               | 2.42           |               | 4.97          |               | 4.20           |               | 5.22          |               | 2.31           |               |          |          |          |          |          |          |          |          |          |          |
| Total Solids                                       | NE                       | %                          | 82.06         |               | 52.95          |               | 53.38         |               | 66.36          |               | 48.20         |               | 66.35          |               | 45.68         |               | 61.92          |               | 74.59          |               | 73.4           |               | 48.25         |               | 68.02          |               | 50.08         |               | 78.04          |               |          |          |          |          |          |          |          |          |          |          |
| Metals (dry weight) <sup>2</sup>                   |                          |                            |               |               |                |               |               |               |                |               |               |               |                |               |               |               |                |               |                |               |                |               |               |               |                |               |               |               |                |               |          |          |          |          |          |          |          |          |          |          |
| Copper                                             | 390                      | mg/kg                      | 53.7          |               | 26.6           |               | 109           |               | 41.6           |               | 143           |               | 39.0           |               | 1,250 D       |               | 85.7           |               | 41.1           |               | –              |               | 84.5          |               | 38.6           |               | 72.2          |               | 29.9           |               |          |          |          |          |          |          |          |          |          |          |
| Mercury                                            | 0.41                     | mg/kg                      | 0.136         |               | 0.0392         |               | 0.263         |               | 0.118          |               | 0.243         |               | 0.133          |               | 0.318         |               | 0.155          |               | 0.0607         |               | –              |               | 0.256         |               | 0.0764         |               | 0.218         |               | 0.0618         |               |          |          |          |          |          |          |          |          |          |          |
| Zinc                                               | 410                      | mg/kg                      | 82.4          |               | 51.4           |               | 138           |               | 59.8           |               | 137           |               | 62.8           |               | 1,380 D       |               | 109            |               | 69.4           |               | –              |               | 132           |               | 66.7           |               | 119           |               | 47.4           |               |          |          |          |          |          |          |          |          |          |          |
| Organometallic Compounds (dry weight) <sup>3</sup> |                          |                            |               |               |                |               |               |               |                |               |               |               |                |               |               |               |                |               |                |               |                |               |               |               |                |               |               |               |                |               |          |          |          |          |          |          |          |          |          |          |
| Tributyltin Ion                                    | 73                       | µg/kg                      | 40.6          |               | 14.3           |               | 393 D         |               | 48.5           |               | 602 D         |               | 52.6           |               | 2,970 D       |               | 41.3           |               | 304            |               | 3.79 U         |               | 49.4          |               | 18.1           |               | 40.4          |               | 3.84 U         |               |          |          |          |          |          |          |          |          |          |          |

Notes:

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**Table 1**  
**Marine Services Northwest Physical and Chemical Analytical Results**  
**DRAFT MSNW Independent Cleanup**  
**Bellingham, Washington**

| Chemical Analysis                     | DMMP Marine Guideline Screening Value <sup>2</sup> |     |      | Sample Identification <sup>1</sup> | MSNW-COMP-1 |             |           | MSNW-COMP-2 |            |            |       |           |
|---------------------------------------|----------------------------------------------------|-----|------|------------------------------------|-------------|-------------|-----------|-------------|------------|------------|-------|-----------|
|                                       |                                                    |     |      | Sample Date                        | 11/21/2024  | Qualifiers  |           |             | 11/21/2024 | Qualifiers |       |           |
|                                       |                                                    |     |      |                                    |             | Sample Type | Composite | Lab         |            | Validator  | Final | Composite |
|                                       | ML                                                 | BT  | SL   |                                    |             |             |           |             |            |            |       |           |
| Conventionals                         |                                                    |     |      |                                    |             |             |           |             |            |            |       |           |
| Total Organic Carbon                  | NE                                                 | NE  | NE   | %                                  | 1.64        |             | J         | J           | 1.50       |            | J     | J         |
| Total Volatile Solids                 | NE                                                 | NE  | NE   | %                                  | 6.48        |             |           |             | 3.30       |            |       |           |
| Total Solids                          | NE                                                 | NE  | NE   | %                                  | 52.97       |             |           |             | 74.97      |            |       |           |
| Total Solids                          | NE                                                 | NE  | NE   | %                                  | 52.87       |             |           |             | 72.64      |            |       |           |
| Metals (Dry Weight)                   |                                                    |     |      |                                    |             |             |           |             |            |            |       |           |
| Antimony                              | 200                                                | NE  | 150  | mg/Kg                              | 0.37        | U           | UJ        | UJ          | 0.27       | U          | UJ    | UJ        |
| Copper                                | 1300                                               | NE  | 390  | mg/Kg                              | --          |             |           |             | --         |            |       |           |
| Mercury                               | 2.3                                                | 1.5 | 0.41 | mg/Kg                              | 0.239       |             |           |             | 0.0674     |            |       |           |
| Zinc                                  | 3800                                               | NE  | 410  | mg/Kg                              | 115         |             |           |             | 50.1       |            |       |           |
| Organometallic Compounds (Dry Weight) |                                                    |     |      |                                    |             |             |           |             |            |            |       |           |
| Tributyltin Ion                       |                                                    | 73  |      | ug/Kg                              | 3.84        | U           |           | U           | 12.4       |            |       |           |
| LPAH Hydrocarbons (Dry Weight)        |                                                    |     |      |                                    |             |             |           |             |            |            |       |           |
| Sum of LPAHs                          | 29                                                 | NE  | 5.2  | mg/Kg                              | 0.0453      | J           |           | J           | 0.0865     | J          |       | J         |
| 2-Methylnaphthalene                   | 1.9                                                | NE  | 0.67 | mg/Kg                              | 0.0123      | J           |           | J           | 0.0440     |            |       |           |
| Acenaphthene                          | 2                                                  | NE  | 0.5  | mg/Kg                              | 0.0200      | U           |           | U           | 0.0198     | U          |       | U         |
| Acenaphthylene                        | 1.3                                                | NE  | 0.56 | mg/Kg                              | 0.0200      | U           |           | U           | 0.0198     | U          |       | U         |
| Anthracene                            | 13                                                 | NE  | 0.96 | mg/Kg                              | 0.0200      | U           |           | U           | 0.0136     | J          |       | J         |
| Fluorene                              | 3.6                                                | NE  | 0.54 | mg/Kg                              | 0.0200      | U           |           | U           | 0.0198     | U          |       | U         |
| Naphthalene                           | 2.4                                                | NE  | 2.1  | mg/Kg                              | 0.0154      | J           |           | J           | 0.0330     |            |       |           |
| Phenanthrene                          | 21                                                 | NE  | 1.5  | bb                                 | 0.0299      |             |           |             | 0.0399     |            |       |           |
| LPAH Hydrocarbons (OC Normalized)     |                                                    |     |      |                                    |             |             |           |             |            |            |       |           |
| Sum of LPAHs                          | NE                                                 | NE  | NE   | mg/kg OC                           | 2.76        | J           |           | J           | 5.77       | J          |       | J         |
| 2-Methylnaphthalene                   | NE                                                 | NE  | NE   | mg/kg OC                           | 0.75        | J           |           | J           | 2.93       |            |       |           |
| Acenaphthene                          | NE                                                 | NE  | NE   | mg/kg OC                           | 1.22        | U           |           | U           | 1.32       | U          |       | U         |
| Acenaphthylene                        | NE                                                 | NE  | NE   | mg/kg OC                           | 1.22        | U           |           | U           | 1.32       | U          |       | U         |
| Anthracene                            | NE                                                 | NE  | NE   | mg/kg OC                           | 1.22        | U           |           | U           | 0.907      | J          |       | J         |
| Fluorene                              | NE                                                 | NE  | NE   | mg/kg OC                           | 1.22        | U           |           | U           | 1.32       | U          |       | U         |
| Naphthalene                           | NE                                                 | NE  | NE   | mg/kg OC                           | 0.939       | J           |           | J           | 2.2        |            |       |           |
| Phenanthrene                          | NE                                                 | NE  | NE   | mg/kg OC                           | 1.82        |             |           |             | 2.66       |            |       |           |

| Chemical Analysis                     | DMMP Marine Guideline Screening Value <sup>2</sup> |       |       | Sample Identification <sup>1</sup> | MSNW-COMP-1 |             |           | MSNW-COMP-2 |            |            |       |           |
|---------------------------------------|----------------------------------------------------|-------|-------|------------------------------------|-------------|-------------|-----------|-------------|------------|------------|-------|-----------|
|                                       |                                                    |       |       | Sample Date                        | 11/21/2024  | Qualifiers  |           |             | 11/21/2024 | Qualifiers |       |           |
|                                       |                                                    |       |       |                                    |             | Sample Type | Composite | Lab         |            | Validator  | Final | Composite |
|                                       | ML                                                 | BT    | SL    |                                    |             |             |           |             |            |            |       |           |
| HPAH Hydrocarbons (DryWeight)         |                                                    |       |       |                                    |             |             |           |             |            |            |       |           |
| Sum of HPAHs                          | 69                                                 | NE    | 12    | mg/Kg                              | 0.4135      | J           |           | J           | 0.3299     | J          |       | J         |
| Benzo(a)anthracene                    | 5.1                                                | NE    | 1.3   | mg/Kg                              | 0.0103      | J           |           | J           | 0.0190     | J          | J     | J         |
| Benzo(a)pyrene                        | 3.6                                                | NE    | 1.6   | mg/Kg                              | 0.0200      | U           |           | U           | 0.0228     |            | J     | J         |
| Benzo(g,h,i)perylene                  | 3.2                                                | NE    | 0.67  | mg/Kg                              | 0.0933      |             | J         | J           | 0.101      |            | J     | J         |
| Benzofluoranthenes (Total)            | 9.9                                                | NE    |       | mg/Kg                              | 0.0312      | J           |           | J           | 0.0331     | J          | J     | J         |
| Chrysene                              | 21                                                 | NE    | 1.4   | mg/Kg                              | 0.0273      |             |           |             | 0.0203     |            | J     | J         |
| Fluoranthene                          | 30                                                 | 4.6   | 1.7   | mg/Kg                              | 0.11        |             |           |             | 0.0502     |            | J     | J         |
| Indeno(1,2,3-c,d)pyrene               | 4.4                                                | NE    | 0.6   | mg/Kg                              | 0.0200      | U           |           | U           | 0.0198     | U          |       | U         |
| Pyrene                                | 16                                                 | 11.98 | 2.6   | mg/Kg                              | 0.128       |             |           |             | 0.0687     |            | J     | J         |
| Total cPAH TEQ (ND=0)                 | NE                                                 | NE    | NE    | mg/Kg                              | 0.005763    | J           |           | J           | 0.029693   | J          |       | J         |
| Total cPAH TEQ (ND=0.5RL)             | NE                                                 | NE    | NE    | mg/Kg                              | 0.016763    | J           |           | J           | 0.030683   | J          |       | J         |
| HPAH Hydrocarbons (OC Normalized)     |                                                    |       |       |                                    |             |             |           |             |            |            |       |           |
| Sum of HPAHs                          | NE                                                 | NE    | NE    | mg/kg OC                           | 25.21       | J           |           | J           | 21.99      | J          |       | J         |
| Benzo(a)anthracene                    | NE                                                 | NE    | NE    | mg/kg OC                           | 0.628       | J           |           | J           | 1.27       | J          | J     | J         |
| Benzo(a)pyrene                        | NE                                                 | NE    | NE    | mg/kg OC                           | 1.22        | U           |           | U           | 1.52       |            | J     | J         |
| Benzo(g,h,i)perylene                  | NE                                                 | NE    | NE    | mg/kg OC                           | 5.69        |             | J         | J           | 6.73       |            | J     | J         |
| Benzofluoranthenes (Total)            | NE                                                 | NE    | NE    | mg/kg OC                           | 1.9         | J           |           | J           | 2.21       | J          | J     | J         |
| Chrysene                              | NE                                                 | NE    | NE    | mg/kg OC                           | 1.66        |             |           |             | 1.35       |            | J     | J         |
| Dibenzo(a,h)anthracene                | NE                                                 | NE    | NE    | mg/kg OC                           | 0.817       |             |           |             | 0.987      |            |       |           |
| Fluoranthene                          | NE                                                 | NE    | NE    | mg/kg OC                           | 6.7         |             |           |             | 3.35       |            | J     | J         |
| Indeno(1,2,3-c,d)pyrene               | NE                                                 | NE    | NE    | mg/kg OC                           | 1.22        | U           |           | U           | 1.32       | U          |       | U         |
| Pyrene                                | NE                                                 | NE    | NE    | mg/kg OC                           | 7.8         |             |           |             | 4.58       |            | J     | J         |
| Total cPAH TEQ (ND=0)                 | NE                                                 | NE    | NE    | mg/kg OC                           | 0.35        | J           |           | J           | 1.97       | J          |       | J         |
| Total cPAH TEQ (ND=0.5RL)             | NE                                                 | NE    | NE    | mg/kg OC                           | 1.02        | J           |           | J           | 2.04       | J          |       | J         |
| Chlorinated Hydrocarbons (Dry Weight) |                                                    |       |       |                                    |             |             |           |             |            |            |       |           |
| 1,2,4-Trichlorobenzene                | 0.064                                              | NE    | 0.031 | mg/Kg                              | 0.0050      | U           |           | U           | 0.0050     | U          |       | U         |
| 1,2-Dichlorobenzene                   | 0.11                                               | NE    | 0.035 | mg/Kg                              | 0.0050      | U           |           | U           | 0.0050     | U          |       | U         |
| 1,4-Dichlorobenzene                   | 0.12                                               | NE    | 0.11  | mg/Kg                              | 0.0050      | U           |           | U           | 0.0050     | U          |       | U         |
| Hexachlorobenzene                     | 0.23                                               | 0.168 | 0.022 | mg/Kg                              | 0.00045     | J           |           | J           | 0.00050    | U          |       | U         |
| Chlorinated Hydrocarbons (OC Norm)    |                                                    |       |       |                                    |             |             |           |             |            |            |       |           |
| 1,2,4-Trichlorobenzene                | NE                                                 | NE    | NE    | mg/kg OC                           | 0.3         | U           |           | U           | 0.33       | U          |       | U         |
| 1,2-Dichlorobenzene                   | NE                                                 | NE    | NE    | mg/kg OC                           | 0.3         | U           |           | U           | 0.33       | U          |       | U         |
| 1,4-Dichlorobenzene                   | NE                                                 | NE    | NE    | mg/kg OC                           | 0.3         | U           |           | U           | 0.33       | U          |       | U         |
| Hexachlorobenzene                     | NE                                                 | NE    | NE    | mg/kg OC                           | 0.027       | J           |           | J           | 0.033      | U          |       | U         |

| Chemical Analysis                       | DMMP Marine Guideline Screening Value <sup>2</sup> |       |       | Sample Identification <sup>1</sup> | MSNW-COMP-1 |             |           | MSNW-COMP-2 |            |            |       |           |
|-----------------------------------------|----------------------------------------------------|-------|-------|------------------------------------|-------------|-------------|-----------|-------------|------------|------------|-------|-----------|
|                                         |                                                    |       |       | Sample Date                        | 11/21/2024  | Qualifiers  |           |             | 11/21/2024 | Qualifiers |       |           |
|                                         |                                                    |       |       |                                    |             | Sample Type | Composite | Lab         |            | Validator  | Final | Composite |
|                                         | ML                                                 | BT    | SL    |                                    |             |             |           |             |            |            |       |           |
| Phthalates (Dry Weight)                 |                                                    |       |       |                                    |             |             |           |             |            |            |       |           |
| Bis(2-Ethylhexyl) Phthalate             | 8.3                                                | NE    | 1.3   | mg/Kg                              | 0.0499      | U           |           | U           | 0.0496     | U          |       | U         |
| Dibutyl Phthalate                       | NE                                                 | NE    | 1.4   | mg/Kg                              | 0.0200      | U           |           | U           | 0.0198     | U          |       | U         |
| Diethyl Phthalate                       | 1.2                                                | NE    | 0.2   | mg/Kg                              | 0.0200      | U           |           | U           | 0.0198     | U          |       | U         |
| Dimethyl Phthalate                      | 1.4                                                | NE    | 0.071 | mg/Kg                              | 0.0080      |             |           |             | 0.0257     |            |       |           |
| Di-N-Octyl Phthalate                    | 6.2                                                | NE    | 6.2   | mg/Kg                              | 0.0200      | U           |           | U           | 0.48       | B          | J     | J         |
| 6a Phthalates (OC Normalized)           |                                                    |       |       |                                    |             |             |           |             |            |            |       |           |
| Bis(2-Ethylhexyl) Phthalate             | NE                                                 | NE    | NE    | mg/kg OC                           | 3.04        | U           |           | U           | 3.31       | U          |       | U         |
| Butyl benzyl Phthalate                  | NE                                                 | NE    | NE    | mg/kg OC                           | 0.3         | U           |           | U           | 0.33       | U          |       | U         |
| Dibutyl Phthalate                       | NE                                                 | NE    | NE    | mg/kg OC                           | 1.22        | U           |           | U           | 1.32       | U          |       | U         |
| Diethyl Phthalate                       | NE                                                 | NE    | NE    | mg/kg OC                           | 1.22        | U           |           | U           | 1.32       | U          |       | U         |
| Dimethyl Phthalate                      | NE                                                 | NE    | NE    | mg/kg OC                           | 0.49        |             |           |             | 1.71       |            |       |           |
| Di-N-Octyl Phthalate                    | NE                                                 | NE    | NE    | mg/kg OC                           | 1.22        | U           |           | U           | 32         | B          | J     | J         |
| Phenols (Dry Weight)                    |                                                    |       |       |                                    |             |             |           |             |            |            |       |           |
| 2,4-Dimethylphenol                      | 0.21                                               | NE    | 0.029 | mg/Kg                              | 0.0200      | U           |           | U           | 0.0192     | J          |       | J         |
| 2-methylphenol                          | 0.077                                              | NE    | 0.063 | mg/Kg                              | 0.0050      | U           |           | U           | 0.0103     |            |       |           |
| 4-methylphenol                          | 3.6                                                | NE    | 0.67  | mg/Kg                              | 0.125       |             |           |             | 0.0312     |            |       |           |
| Pentachlorophenol                       | 0.69                                               | 0.504 | 0.4   | mg/Kg                              | 0.0499      | U           |           | U           | 0.0496     | U          |       | U         |
| Phenol                                  | 1.2                                                | NE    | 0.42  | mg/Kg                              | 0.0269      | B           | J         | J           | 0.0218     | B          | J     | J         |
| Miscellaneous Extractables (Dry Weight) |                                                    |       |       |                                    |             |             |           |             |            |            |       |           |
| Benzoic Acid                            | 0.76                                               | NE    | 0.65  | mg/Kg                              | 0.0677      | J           |           | J           | 0.0582     | J          |       | J         |
| Benzyl Alcohol                          | 0.87                                               | NE    | 0.057 | mg/Kg                              | 0.0200      | U           |           | U           | 0.0198     | U          |       | U         |
| Dibenzofuran                            | 1.7                                                | NE    | 0.54  | mg/Kg                              | 0.0200      | U           |           | U           | 0.0266     |            |       |           |
| Hexachlorobutadiene                     | 0.27                                               | NE    | 0.011 | mg/Kg                              | 0.00050     | U           |           | U           | 0.00050    | U          |       | U         |
| N-Nitrosodiphenylamine                  | 0.13                                               | NE    | 0.028 | mg/Kg                              | 0.0050      | U           |           | U           | 0.0050     | U          |       | U         |
| Miscellaneous Extractables (OC Norm)    |                                                    |       |       |                                    |             |             |           |             |            |            |       |           |
| Dibenzofuran                            | NE                                                 | NE    | NE    | mg/kg OC                           | 1.22        | U           |           | U           | 1.77       |            |       |           |
| Hexachlorobutadiene                     | NE                                                 | NE    | NE    | mg/kg OC                           | 0.03        | U           |           | U           | 0.033      | U          |       | U         |
| N-Nitrosodiphenylamine                  | NE                                                 | NE    | NE    | mg/kg OC                           | 0.3         | U           |           | U           | 0.33       | U          |       | U         |
| Pesticides (Dry Weight)                 |                                                    |       |       |                                    |             |             |           |             |            |            |       |           |
| 4,4'-DDD                                | NE                                                 | NE    | 16    | ug/Kg                              | 1.00        | U           |           | U           | 1.00       | U          |       | U         |
| 4,4'-DDE                                | NE                                                 | NE    | 9     | ug/Kg                              | 1.00        | U           |           | U           | 1.00       | U          |       | U         |
| 4,4'-DDT                                | NE                                                 | NE    | 12    | ug/Kg                              | 1.00        | U           |           | U           | 1.00       | U          |       | U         |
| Total DDT (4,4 Isomers)                 | 69                                                 | 50    | NE    | ug/Kg                              | 1           | U           |           | U           | 1          | U          |       | U         |
| Aldrin                                  | NE                                                 | NE    | 9.5   | ug/Kg                              | 0.50        | U           |           | U           | 0.50       | U          |       | U         |
| cis-Chlordane                           | NE                                                 | NE    | NE    | ug/Kg                              | 0.50        | U           |           | U           | 0.50       | U          |       | U         |
| cis-Nonachlor                           | NE                                                 | NE    | NE    | ug/Kg                              | 1.00        | U           |           | U           | 1.00       | U          |       | U         |
| Oxychlordane                            | NE                                                 | NE    | NE    | ug/Kg                              | 1.00        | U           |           | U           | 1.00       | U          |       | U         |
| trans-Chlordane                         | NE                                                 | NE    | NE    | ug/Kg                              | 0.50        | U           |           | U           | 0.50       | U          |       | U         |
| trans-Nonachlor                         | NE                                                 | NE    | NE    | ug/Kg                              | 1.00        | U           | UJ        | UJ          | 1.00       | U          | UJ    | UJ        |
| Chlordane (Total)                       | NE                                                 | 37    | 2.8   | ug/Kg                              | 1.00        | UJ          |           | U           | 1.00       | UJ         |       | U         |
| Dieldrin                                | 1700                                               | NE    | 1.9   | ug/Kg                              | 1.00        | U           |           | U           | 1.00       | U          |       | U         |
| Heptachlor                              | 270                                                | NE    | 1.5   | ug/Kg                              | 0.50        | U           |           | U           | 0.50       | U          |       | U         |

| Chemical Analysis                                | DMMP Marine Guideline Screening Value <sup>2</sup> |    |      | Sample Identification <sup>1</sup> | MSNW-COMP-1 |             |           | MSNW-COMP-2 |            |            |       |           |
|--------------------------------------------------|----------------------------------------------------|----|------|------------------------------------|-------------|-------------|-----------|-------------|------------|------------|-------|-----------|
|                                                  |                                                    |    |      | Sample Date                        | 11/21/2024  | Qualifiers  |           |             | 11/21/2024 | Qualifiers |       |           |
|                                                  |                                                    |    |      |                                    |             | Sample Type | Composite | Lab         |            | Validator  | Final | Composite |
|                                                  | ML                                                 | BT | SL   |                                    |             |             |           |             |            |            |       |           |
| PCBs (Dry Weight)                                |                                                    |    |      |                                    |             |             |           |             |            |            |       |           |
| PCB-Aroclor 1016                                 | NE                                                 | NE | NE   | mg/Kg                              | 0.0040      | U           |           | U           | 0.0040     | U          |       | U         |
| PCB-Aroclor 1221                                 | NE                                                 | NE | NE   | mg/Kg                              | 0.0040      | U           |           | U           | 0.0040     | U          |       | U         |
| PCB-Aroclor 1232                                 | NE                                                 | NE | NE   | mg/Kg                              | 0.0040      | U           |           | U           | 0.0040     | U          |       | U         |
| PCB-Aroclor 1242                                 | NE                                                 | NE | NE   | mg/Kg                              | 0.0040      | U           |           | U           | 0.0040     | U          |       | U         |
| PCB-Aroclor 1248                                 | NE                                                 | NE | NE   | mg/Kg                              | 0.0040      | U           |           | U           | 0.0040     | U          |       | U         |
| PCB-Aroclor 1254                                 | NE                                                 | NE | NE   | mg/Kg                              | 0.0040      | U           |           | U           | 0.0040     | U          |       | U         |
| PCB-Aroclor 1260                                 | NE                                                 | NE | NE   | mg/Kg                              | 0.0040      | U           |           | U           | 0.0040     | U          |       | U         |
| Total PCB Aroclors                               | 3.1                                                |    | 0.13 | mg/Kg                              | 0.004       | U           |           | U           | 0.004      | U          |       | U         |
| PCBs (OC Normalized)                             |                                                    |    |      |                                    |             |             |           |             |            |            |       |           |
| PCB-Aroclor 1016                                 | NE                                                 | NE | NE   | mg/kg OC                           | 0.24        | U           |           | U           | 0.27       | U          |       | U         |
| PCB-Aroclor 1221                                 | NE                                                 | NE | NE   | mg/kg OC                           | 0.24        | U           |           | U           | 0.27       | U          |       | U         |
| PCB-Aroclor 1232                                 | NE                                                 | NE | NE   | mg/kg OC                           | 0.24        | U           |           | U           | 0.27       | U          |       | U         |
| PCB-Aroclor 1242                                 | NE                                                 | NE | NE   | mg/kg OC                           | 0.24        | U           |           | U           | 0.27       | U          |       | U         |
| PCB-Aroclor 1248                                 | NE                                                 | NE | NE   | mg/kg OC                           | 0.24        | U           |           | U           | 0.27       | U          |       | U         |
| PCB-Aroclor 1254                                 | NE                                                 | NE | NE   | mg/kg OC                           | 0.24        | U           |           | U           | 0.27       | U          |       | U         |
| PCB-Aroclor 1260                                 | NE                                                 | NE | NE   | mg/kg OC                           | 0.24        | U           |           | U           | 0.27       | U          |       | U         |
| Total PCB Aroclors                               | NE                                                 | NE | NE   | mg/kg OC                           | 0.24        | U           |           | U           | 0.26       | U          |       | U         |
| Dioxins/Furans (Dry Weight)                      |                                                    |    |      |                                    |             |             |           |             |            |            |       |           |
| 1,2,3,4,6,7,8-HpCDD                              | NE                                                 | NE | NE   | ng/Kg                              | 540         |             |           |             | 55.5       |            |       |           |
| 1,2,3,4,6,7,8-HpCDF                              | NE                                                 | NE | NE   | ng/Kg                              | 49.8        |             |           |             | 7.07       |            |       |           |
| 1,2,3,4,7,8,9-HpCDF                              | NE                                                 | NE | NE   | ng/Kg                              | 2.78        |             |           |             | 0.265      | U          |       | U         |
| 1,2,3,4,7,8-HxCDD                                | NE                                                 | NE | NE   | ng/Kg                              | 6.94        |             |           |             | 0.743      | J          |       | J         |
| 1,2,3,4,7,8-HxCDF                                | NE                                                 | NE | NE   | ng/Kg                              | 4.17        |             |           |             | 0.577      | J          |       | J         |
| 1,2,3,6,7,8-HxCDD                                | NE                                                 | NE | NE   | ng/Kg                              | 29.3        |             |           |             | 2.87       |            |       |           |
| 1,2,3,6,7,8-HxCDF                                | NE                                                 | NE | NE   | ng/Kg                              | 2.37        |             |           |             | 0.261      | J          |       | J         |
| 1,2,3,7,8,9-HxCDD                                | NE                                                 | NE | NE   | ng/Kg                              | 15.4        |             |           |             | 1.70       |            |       |           |
| 1,2,3,7,8,9-HxCDF                                | NE                                                 | NE | NE   | ng/Kg                              | 2.09        |             |           |             | 0.174      | U          |       | U         |
| 1,2,3,7,8-PeCDD                                  | NE                                                 | NE | NE   | ng/Kg                              | 4.47        |             |           |             | 0.277      | EMPC, J    | U     | U         |
| 1,2,3,7,8-PeCDF                                  | NE                                                 | NE | NE   | ng/Kg                              | 1.18        |             |           |             | 0.247      | U          |       | U         |
| 2,3,4,6,7,8-HxCDF                                | NE                                                 | NE | NE   | ng/Kg                              | 3.02        |             |           |             | 0.144      | EMPC, J    | U     | U         |
| 2,3,4,7,8-PeCDF                                  | NE                                                 | NE | NE   | ng/Kg                              | 1.38        |             |           |             | 0.248      | J          |       | J         |
| 2,3,7,8-TCDD                                     | NE                                                 | NE | NE   | ng/Kg                              | 0.340       | J           |           | J           | 0.201      | U          |       | U         |
| 2,3,7,8-TCDF                                     | NE                                                 | NE | NE   | ng/Kg                              | 4.33        |             |           |             | 0.550      | J          |       | J         |
| OCDD                                             | NE                                                 | NE | NE   | ng/Kg                              | 3340        |             |           |             | 391        |            |       |           |
| OCDF                                             | NE                                                 | NE | NE   | ng/Kg                              | 87.8        |             |           |             | 12.1       |            |       |           |
| Total HpCDD                                      | NE                                                 | NE | NE   | ng/Kg                              | 1050        |             |           |             | 110        |            |       |           |
| Total HpCDF                                      | NE                                                 | NE | NE   | ng/Kg                              | 159         |             |           |             | 22.1       |            |       |           |
| Total HxCDD                                      | NE                                                 | NE | NE   | ng/Kg                              | 295         |             |           |             | 34.1       |            |       |           |
| Total HxCDF                                      | NE                                                 | NE | NE   | ng/Kg                              | 90.0        |             |           |             | 5.95       |            |       |           |
| Total PeCDD                                      | NE                                                 | NE | NE   | ng/Kg                              | 70.8        |             |           |             | 4.63       |            | J     | J         |
| Total PeCDF                                      | NE                                                 | NE | NE   | ng/Kg                              | 18.1        |             |           |             | 1.96       |            |       |           |
| Total TCDD                                       | NE                                                 | NE | NE   | ng/Kg                              | 72.5        |             |           |             | 2.54       |            | J     | J         |
| Total TCDF                                       | NE                                                 | NE | NE   | ng/Kg                              | 18.8        |             |           |             | 0.550      | J          |       | J         |
| Total Dioxin/Furan TEQ (ND=0) - Human/Mammal     | NE                                                 | 4  | NE   | ng/Kg                              | 18.9755     |             |           | J           | 1.49113    |            |       | J         |
| Total Dioxin/Furan TEQ (ND=0.5DL) - Human/Mammal | NE                                                 | 4  | NE   | ng/Kg                              | 18.9755     |             |           | J           | 1.75106    |            |       | J         |

Notes:

<sup>1</sup>MSNW-Comp-1 Sample is prepared using the archived OL samples (ranging between -8.7 to 13.1 ft MLLW bml) from locations SED-01, SED-02, SED-03, SED-04, SED-05, SED-06, and SED-11. MSNW-Comp-2 Sample is prepared using the the archived top two SP-SM samples from SED-01, and the first SP-SM sample from SED-02, SED-03, SED-05, SED-06, SED-11.

- = not analyzed
- µg/kg = microgram per kilogram
- bml = below mudline
- CSL = Cleanup Screening Level
- ft = feet
- mg/kg = milligram per kilogram
- MLLW = Mean Lower-Low Water
- NE = not established
- ng/kg = nanogram per kilogram

Sediment Type Description:

- CL = Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
- SP-SM = Poorly -graded sands, gravelly sand to silty sands, sand-silt mixtures
- OL = Organic silts and organic silty clays of low plasticity

Laboratory/Validated Qualifier:

- B = This analyte was detected in the method blank. Data were qualified "U" if result is less than appropriate 5X action level.
- D = The reported value is from a dilution
- EMPC = Estimated Maximum Possible Concentration
- J = The analyte was detected and the detected concentration is considered an estimate.
- NJ = The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration.
- P1 = The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
- Q = Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
- U = The analyte was not detected at a concentration greater than the value identified.
- UJ =The analyte was not detected at a concentration greater than the value identified. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- X = Indicates possible chlorinated diphenyl ethers (CDPE) interference. Method detection limit (MDL) and method reporting limit (MRL) are elevated due to dilution.
- J = The analyte was detected and the detected concentration is considered an estimate.

**Bold font type** indicates the analyte was detected at the reported concentration.

 Orange shading indicates exceedance of the DMMP bioaccumulation trigger (BT) screening level.