

SEP 14 2021



DEPARTMENT OF THE NAVY

COMMANDER  
NAVY REGION HAWAII  
850 TICONDEROGA ST STE 110  
JBPHH, HAWAII 96860-5101

5000-45A  
N45  
September 13, 2021

**CERTIFIED NO: 9489 0090 0027 6232 2135 11**

Mr. Richard Takaba  
Hawaii Department of Health  
Solid and Hazardous Waste Branch  
Underground Storage Tank Section  
2827 Waimano Home Road #100  
Pearl City, Hawaii 96782

Dear Mr. Takaba:

SUBJECT: AUGUST 2021 OIL/WATER INTERFACE MEASUREMENTS  
RED HILL TANK COMPLEX  
DOH FACILITY ID NO. 9-102271  
DOH RELEASE ID NO. 990051, 010011, 020028, 140010, AND 210012

In response to the January 2014 release from Red Hill Tank 5, oil/water interface measurements were taken at groundwater monitoring wells RHMW01R, RHMW02, RHMW03 and RHMW05 on August 20, 2021. No free product was observed in the wells.

RHMW01R is a newly constructed well, installed in May 2021 to replace RHMW01. Beginning with this event and going forward, oil/water interface measurements will be performed at RHMW01R and discontinued at RHMW01.

A summary of the oil/water interface measurements from January 2014 through August 2021 is being submitted as an enclosure.

If there are any questions regarding this matter, or if more information is needed, please contact Ms. Susan Lohr at (808) 471-4619 or Ms. Dayna Fujimoto at (808) 471-4805.

Sincerely,

A handwritten signature in black ink, appearing to read "SRS", is written over the typed name "SHERRI R. ENG".

SHERRI R. ENG

Director  
Regional Environmental Department  
By direction of the  
Commander

5000-45A  
N45  
September 13, 2021

Enclosure: Red Hill Oil/Water Interface Measurements, January 2014 to Present

Hard Copy to: Mr. Michael Miyahira, DOH Safe Drinking Water Branch  
Mr. John Floyd, NAVSUP FLC Pearl Harbor

Electronic Copy (sent via email) to:

Ms. Gabriela Carvalho, U.S. EPA Region 9, Red Hill Program Coordinator

Mr. John Reed, DLA Energy Pacific

Mr. William Potter, DLA Energy - Engineering, Environmental, Property Directorate

Red Hill Oil/Water Interface Measurements January 2014 to Present

| Date       | RHMW01                               |       |       | RHMW01R                 |     |       | RHMW02                               |       |       | RHMW03                               |       |       | RHMW05                               |       |       |
|------------|--------------------------------------|-------|-------|-------------------------|-----|-------|--------------------------------------|-------|-------|--------------------------------------|-------|-------|--------------------------------------|-------|-------|
|            | Elevation = 101.9955 ft <sup>1</sup> |       |       | Elevation = 101.7570 ft |     |       | Elevation = 104.5970 ft <sup>1</sup> |       |       | Elevation = 120.8980 ft <sup>1</sup> |       |       | Elevation = 101.3102 ft <sup>1</sup> |       |       |
|            | DTW (TOC)                            | SWL   | LNAPL | DTW (TOC)               | SWL | LNAPL | DTW (TOC)                            | SWL   | LNAPL | DTW (TOC)                            | SWL   | LNAPL | DTW (TOC)                            | SWL   | LNAPL |
| 15-Jan-14  | 83.94                                | 18.06 | 0     |                         |     |       | 86.62                                | 17.98 | 0     | NT                                   | NT    | NT    | NT                                   | NT    | NT    |
| 16-Jan-14  | NT                                   | NT    | NT    |                         |     |       | NT                                   | NT    | NT    | NT                                   | NT    | NT    | 83.09                                | 18.22 | 0     |
| 22-Jan-14  | 83.53                                | 18.47 | 0     |                         |     |       | 86.20                                | 18.40 | 0     | NT                                   | NT    | NT    | 82.87                                | 18.44 | 0     |
| 23-Jan-14  | 83.58                                | 18.42 | 0     |                         |     |       | 86.24                                | 18.36 | 0     | NT                                   | NT    | NT    | 82.94                                | 18.37 | 0     |
| 24-Jan-14  | 83.57                                | 18.43 | 0     |                         |     |       | 86.23                                | 18.37 | 0     | NT                                   | NT    | NT    | 82.93                                | 18.38 | 0     |
| 27-Jan-14  | 83.55                                | 18.45 | 0     |                         |     |       | 86.23                                | 18.37 | 0     | NT                                   | NT    | NT    | 82.93                                | 18.38 | 0     |
| 28-Jan-14  | 83.56                                | 18.44 | 0     |                         |     |       | 86.25                                | 18.35 | 0     | 102.52                               | 18.38 | 0     | 82.94                                | 18.37 | 0     |
| 29-Jan-14  | 83.56                                | 18.44 | 0     |                         |     |       | 86.22                                | 18.38 | 0     | NT                                   | NT    | NT    | 82.94                                | 18.37 | 0     |
| 30-Jan-14  | 83.53                                | 18.47 | 0     |                         |     |       | 86.21                                | 18.39 | 0     | NT                                   | NT    | NT    | 82.93                                | 18.38 | 0     |
| 31-Jan-14  | 83.53                                | 18.47 | 0     |                         |     |       | 86.19                                | 18.41 | 0     | NT                                   | NT    | NT    | 82.88                                | 18.43 | 0     |
| 3-Feb-14   | 83.54                                | 18.46 | 0     |                         |     |       | 86.20                                | 18.40 | 0     | NT                                   | NT    | NT    | 82.91                                | 18.40 | 0     |
| 4-Feb-14   | 83.54                                | 18.46 | 0     |                         |     |       | 86.20                                | 18.40 | 0     | NT                                   | NT    | NT    | 82.89                                | 18.42 | 0     |
| 10-Feb-14  | 84.49                                | 17.51 | 0     |                         |     |       | 86.16                                | 18.44 | 0     | 102.47                               | 18.43 | 0     | 82.83                                | 18.48 | 0     |
| 24-Feb-14  | 83.54                                | 18.46 | 0     |                         |     |       | 86.24                                | 18.36 | 0     | 102.47                               | 18.43 | 0     | 82.97                                | 18.34 | 0     |
| 4-Mar-14*  | NT                                   | NT    | NT    |                         |     |       | NT                                   | NT    | NT    | NT                                   | NT    | NT    | NT                                   | NT    | NT    |
| 13-Mar-14* | NT                                   | NT    | NT    |                         |     |       | NT                                   | NT    | NT    | NT                                   | NT    | NT    | NT                                   | NT    | NT    |
| 28-Mar-14  | 83.76                                | 18.24 | 0     |                         |     |       | 86.42                                | 18.18 | 0     | 102.65                               | 18.25 | 0     | 83.18                                | 18.13 | 0     |
| 7-Apr-14*  | 83.42                                | 18.58 | 0     |                         |     |       | 86.43                                | 18.17 | 0     | NT                                   | NT    | NT    | 83.21                                | 18.10 | 0     |
| 21-Apr-14  | 83.93                                | 18.07 | 0     |                         |     |       | 86.58                                | 18.02 | 0     | 102.80                               | 18.10 | 0     | 83.27                                | 18.04 | 0     |
| 8-May-14*  | 84.03                                | 17.97 | 0     |                         |     |       | 86.68                                | 17.92 | 0     | NT                                   | NT    | NT    | 83.46                                | 17.85 | 0     |
| 22-May-14* | 83.81                                | 18.19 | 0     |                         |     |       | 86.47                                | 18.13 | 0     | NT                                   | NT    | NT    | 83.15                                | 18.16 | 0     |
| 27-May-14  | 83.91                                | 18.09 | 0     |                         |     |       | 86.60                                | 18.00 | 0     | 102.85                               | 18.05 | 0     | 83.31                                | 18.00 | 0     |
| 10-Jun-14* | 83.93                                | 18.07 | 0     |                         |     |       | 86.55                                | 18.05 | 0     | NT                                   | NT    | NT    | 83.34                                | 17.97 | 0     |
| 23-Jun-14  | 84.06                                | 17.94 | 0     |                         |     |       | 86.72                                | 17.88 | 0     | 103.99                               | 16.91 | 0     | 83.54                                | 17.77 | 0     |
| 21-Jul-14  | 84.13                                | 17.87 | 0     |                         |     |       | 86.80                                | 17.80 | 0     | 102.98                               | 17.92 | 0     | 83.49                                | 17.82 | 0     |
| 27-Aug-14  | 84.01                                | 17.99 | 0     |                         |     |       | 86.65                                | 17.95 | 0     | 102.87                               | 18.03 | 0     | 83.04                                | 18.27 | 0     |
| 25-Sep-14  | 84.64                                | 17.36 | 0     |                         |     |       | 87.27                                | 17.33 | 0     | 103.51                               | 17.39 | 0     | 84.10                                | 17.21 | 0     |
| 28-Oct-14  | 83.79                                | 18.21 | 0     |                         |     |       | 86.51                                | 18.09 | 0     | 102.78                               | 18.12 | 0     | 83.21                                | 18.10 | 0     |
| 20-Nov-14  | 83.87                                | 18.13 | 0     |                         |     |       | 86.56                                | 18.04 | 0     | 102.78                               | 18.12 | 0     | 83.35                                | 17.96 | 0     |
| 23-Dec-14  | 83.67                                | 18.33 | 0     |                         |     |       | 86.37                                | 18.23 | 0     | 102.64                               | 18.26 | 0     | 83.05                                | 18.26 | 0     |
| 28-Jan-15  | 83.63                                | 18.37 | 0     |                         |     |       | 86.35                                | 18.25 | 0     | 102.63                               | 18.27 | 0     | 83.03                                | 18.28 | 0     |
| 27-Feb-15  | 83.68                                | 18.32 | 0     |                         |     |       | 86.28                                | 18.32 | 0     | 102.52                               | 18.38 | 0     | 83.06                                | 18.25 | 0     |
| 26-Mar-15  | 83.83                                | 18.17 | 0     |                         |     |       | 86.04                                | 18.56 | 0     | 102.79                               | 18.11 | 0     | 83.24                                | 18.07 | 0     |
| 21-Apr-15  | 84.33                                | 17.67 | 0     |                         |     |       | 86.97                                | 17.63 | 0     | 103.18                               | 17.72 | 0     | 83.72                                | 17.59 | 0     |
| 28-May-15  | 84.29                                | 17.71 | 0     |                         |     |       | 86.97                                | 17.63 | 0     | 103.24                               | 17.66 | 0     | 83.95                                | 17.36 | 0     |
| 25-Jun-15  | 84.58                                | 17.42 | 0     |                         |     |       | 87.28                                | 17.32 | 0     | 103.57                               | 17.33 | 0     | 83.75                                | 17.56 | 0     |

Red Hill Oil/Water Interface Measurements January 2014 to Present

| Date      | RHMW01                               |       |       | RHMW01R                 |     |       | RHMW02                               |       |       | RHMW03                               |        |       | RHMW05                               |       |       |
|-----------|--------------------------------------|-------|-------|-------------------------|-----|-------|--------------------------------------|-------|-------|--------------------------------------|--------|-------|--------------------------------------|-------|-------|
|           | Elevation = 101.9955 ft <sup>1</sup> |       |       | Elevation = 101.7570 ft |     |       | Elevation = 104.5970 ft <sup>1</sup> |       |       | Elevation = 120.8980 ft <sup>1</sup> |        |       | Elevation = 101.3102 ft <sup>1</sup> |       |       |
|           | DTW (TOC)                            | SWL   | LNAPL | DTW (TOC)               | SWL | LNAPL | DTW (TOC)                            | SWL   | LNAPL | DTW (TOC)                            | SWL    | LNAPL | DTW (TOC)                            | SWL   | LNAPL |
| 21-Jul-15 | 84.58                                | 17.42 | 0     |                         |     |       | 87.24                                | 17.36 | 0     | 103.44                               | 17.46  | 0     | 83.76                                | 17.55 | 0     |
| 27-Aug-15 | 84.44                                | 17.56 | 0     |                         |     |       | 87.13                                | 17.47 | 0     | 103.41                               | 17.49  | 0     | 83.69                                | 17.62 | 0     |
| 23-Sep-15 | 84.26                                | 17.74 | 0     |                         |     |       | 86.91                                | 17.69 | 0     | 103.21                               | 17.69  | 0     | 83.63                                | 17.68 | 0     |
| 20-Oct-15 | 84.00                                | 18.00 | 0     |                         |     |       | 86.38                                | 18.22 | 0     | 103.38                               | 17.52  | 0     | Obstructed                           | NT    | NT    |
| 18-Nov-15 | 84.25                                | 17.75 | 0     |                         |     |       | 86.93                                | 17.67 | 0     | 103.24                               | 17.66  | 0     | 84.62 <sup>2</sup>                   | 16.69 | 0     |
| 17-Dec-15 | 83.76                                | 18.24 | 0     |                         |     |       | 86.36                                | 18.24 | 0     | 102.56                               | 18.34  | 0     | 83.18                                | 18.13 | 0     |
| 20-Jan-16 | 83.31                                | 18.69 | 0     |                         |     |       | 85.97                                | 18.63 | 0     | 102.21                               | 18.69  | 0     | Obstructed                           | NT    | NT    |
| 17-Feb-16 | 83.17                                | 18.83 | 0     |                         |     |       | 85.81                                | 18.79 | 0     | 102.10                               | 18.80  | 0     | Obstructed                           | NT    | NT    |
| 15-Mar-16 | 82.89                                | 19.11 | 0     |                         |     |       | 85.60                                | 19.00 | 0     | 101.82                               | 19.08  | 0     | 82.26                                | 19.05 | 0     |
| 20-Apr-16 | 82.97                                | 19.03 | 0     |                         |     |       | 85.63                                | 18.97 | 0     | 101.91                               | 18.99  | 0     | 82.31                                | 19.00 | 0     |
| 23-May-16 | 83.14                                | 18.86 | 0     |                         |     |       | 85.81                                | 18.79 | 0     | 102.03                               | 18.87  | 0     | 82.50                                | 18.81 | 0     |
| 21-Jun-16 | 83.16                                | 18.84 | 0     |                         |     |       | 85.77                                | 18.83 | 0     | 10.03                                | 110.87 | 0     | 82.54                                | 18.77 | 0     |
| 20-Jul-16 | 83.32                                | 18.68 | 0     |                         |     |       | 85.99                                | 18.61 | 0     | 102.31                               | 18.59  | 0     | 82.63                                | 18.68 | 0     |
| 23-Aug-16 | 83.27                                | 18.73 | 0     |                         |     |       | 85.96                                | 18.64 | 0     | 102.20                               | 18.70  | 0     | 82.63                                | 18.68 | 0     |
| 21-Sep-16 | 83.13                                | 18.87 | 0     |                         |     |       | 85.74                                | 18.86 | 0     | 102.06                               | 18.84  | 0     | 82.44                                | 18.87 | 0     |
| 19-Oct-16 | 83.01                                | 18.99 | 0     |                         |     |       | 85.69                                | 18.91 | 0     | 101.95                               | 18.95  | 0     | 82.39                                | 18.92 | 0     |
| 17-Nov-16 | 82.92                                | 19.08 | 0     |                         |     |       | 85.56                                | 19.04 | 0     | 101.82                               | 19.08  | 0     | 82.24                                | 19.07 | 0     |
| 20-Dec-16 | 82.67                                | 19.33 | 0     |                         |     |       | 85.36                                | 19.24 | 0     | 101.61                               | 19.29  | 0     | 82.01                                | 19.30 | 0     |
| 31-Jan-17 | 82.45                                | 19.55 | 0     |                         |     |       | 85.13                                | 19.47 | 0     | 101.46                               | 19.44  | 0     | 82.04                                | 19.27 | 0     |
| 22-Feb-17 | 82.37                                | 19.63 | 0     |                         |     |       | 85.01                                | 19.59 | 0     | 101.31                               | 19.59  | 0     | 81.72                                | 19.59 | 0     |
| 24-Mar-17 | 82.49                                | 19.51 | 0     |                         |     |       | 85.19                                | 19.41 | 0     | 101.45                               | 19.45  | 0     | 81.84                                | 19.47 | 0     |
| 20-Apr-17 | 82.59                                | 19.41 | 0     |                         |     |       | 85.25                                | 19.35 | 0     | 101.5                                | 19.40  | 0     | 81.94                                | 19.37 | 0     |
| 26-May-17 | 82.45                                | 19.55 | 0     |                         |     |       | 85.13                                | 19.47 | 0     | 101.39                               | 19.51  | 0     | 81.80                                | 19.51 | 0     |
| 22-Jun-17 | 82.94                                | 19.06 | 0     |                         |     |       | 85.59                                | 19.01 | 0     | 101.89                               | 19.01  | 0     | 82.30                                | 19.01 | 0     |
| 21-Jul-17 | 83.43                                | 18.57 | 0     |                         |     |       | 86.5                                 | 18.10 | 0     | Transducer<br>Installed              | NT     | NT    | 82.81                                | 18.50 | 0     |
| 20-Mar-18 | 83.56                                | 18.44 | 0     |                         |     |       | 86.24                                | 18.36 | 0     | 102.55                               | 18.35  | 0     | 82.89                                | 18.42 | 0     |
| 25-Apr-18 | 83.47                                | 18.53 | 0     |                         |     |       | 86.14                                | 18.46 | 0     | 102.38                               | 18.52  | 0     | 82.86                                | 18.45 | 0     |
| 22-May-18 | 83.61                                | 18.39 | 0     |                         |     |       | 86.28                                | 18.32 | 0     | 102.56                               | 18.34  | 0     | 82.86                                | 18.45 | 0     |
| 20-Jun-18 | 83.63                                | 18.37 | 0     |                         |     |       | 86.28                                | 18.32 | 0     | 102.57                               | 18.33  | 0     | 82.99                                | 18.32 | 0     |
| 25-Jul-18 | 83.55                                | 18.45 | 0     |                         |     |       | 86.33                                | 18.27 | 0     | 102.58                               | 18.32  | 0     | 82.90                                | 18.41 | 0     |
| 21-Aug-18 | Transducer<br>Installed              | NT    | NT    |                         |     |       | 86.32                                | 18.28 | 0     | 102.58                               | 18.32  | 0     | Transducer<br>Installed              | NT    | NT    |
| 30-Oct-18 | 82.64                                | 19.36 | 0     |                         |     |       | 85.34                                | 19.26 | 0     | 101.58                               | 19.32  | 0     | 81.99                                | 19.32 | 0     |
| 24-Jan-19 | 82.30                                | 19.70 | 0     |                         |     |       | 84.96                                | 19.64 | 0     | 101.22                               | 19.68  | 0     | 81.66                                | 19.65 | 0     |
| 26-Apr-19 | 82.45                                | 19.55 | 0     |                         |     |       | 85.18                                | 19.42 | 0     | 104.41                               | 16.49  | 0     | 81.88                                | 19.43 | 0     |

Red Hill Oil/Water Interface Measurements January 2014 to Present

| Date      | RHMW01                               |       |       | RHMW01R                 |       |       | RHMW02                               |       |       | RHMW03                               |       |       | RHMW05                               |       |       |
|-----------|--------------------------------------|-------|-------|-------------------------|-------|-------|--------------------------------------|-------|-------|--------------------------------------|-------|-------|--------------------------------------|-------|-------|
|           | Elevation = 101.9955 ft <sup>1</sup> |       |       | Elevation = 101.7570 ft |       |       | Elevation = 104.5970 ft <sup>1</sup> |       |       | Elevation = 120.8980 ft <sup>1</sup> |       |       | Elevation = 101.3102 ft <sup>1</sup> |       |       |
|           | DTW (TOC)                            | SWL   | LNAPL | DTW (TOC)               | SWL   | LNAPL | DTW (TOC)                            | SWL   | LNAPL | DTW (TOC)                            | SWL   | LNAPL | DTW (TOC)                            | SWL   | LNAPL |
| 29-Jul-19 | 82.67                                | 19.33 | 0     |                         |       |       | 85.34                                | 19.26 | 0     | 101.57                               | 19.33 | 0     | 82.06                                | 19.25 | 0     |
| 29-Oct-19 | 83.15                                | 18.85 | 0     |                         |       |       | 85.84                                | 18.76 | 0     | 102.19                               | 18.71 | 0     | 82.09                                | 19.22 | 0     |
| 31-Jan-20 | Obstructed                           | NT    | 0     |                         |       |       | 85.88                                | 18.72 | 0     | 102.17                               | 18.73 | 0     | 82.52                                | 18.79 | 0     |
| 23-Apr-20 | 82.93                                | 19.07 | 0     |                         |       |       | 85.68                                | 18.92 | 0     | 101.82                               | 19.08 | 0     | 82.27                                | 19.04 | 0     |
| 24-Jul-20 | 83.28                                | 18.72 | 0     |                         |       |       | 85.94                                | 18.66 | 0     | 102.13                               | 18.77 | 0     | 82.63                                | 18.68 | 0     |
| 15-Oct-20 | 83.69                                | 18.31 | 0     |                         |       |       | 86.39                                | 18.21 | 0     | 102.56                               | 18.34 | 0     | 83.12                                | 18.19 | 0     |
| 27-Jan-21 | 83.53                                | 18.47 | 0     |                         |       |       | 86.23                                | 18.37 | 0     | 102.46                               | 18.44 | 0     | 82.87                                | 18.44 | 0     |
| 22-Apr-21 | 83.85                                | 18.15 | 0     |                         |       |       | 86.53                                | 18.07 | 0     | 102.72                               | 18.18 | 0     | 83.26                                | 18.05 | 0     |
| 20-May-21 | 83.85                                | 18.15 | 0     |                         |       |       | Obstructed                           | NT    | NT    | Obstructed                           | NT    | NT    | 83.42                                | 17.89 | 0     |
| 16-Jun-21 | 84.10                                | 17.90 | 0     |                         |       |       | 86.79                                | 17.81 | 0     | 102.99                               | 17.91 | 0     | 83.53                                | 17.78 | 0     |
| 16-Jul-21 | 84.14                                | 17.86 | 0     |                         |       |       | 86.89                                | 17.71 | 0     | 103.11                               | 17.79 | 0     | 83.62                                | 17.69 | 0     |
| 20-Aug-21 |                                      |       |       | 84.06                   | 17.70 | 0     | 85.96                                | 18.64 | 0     | 103.17                               | 17.73 | 0     | 83.67                                | 17.64 | 0     |

Notes:

1 - Elevations were updated based on the Well Elevation Survey Report, Red Hill Bulk Fuel Storage Facility (DON 2018).

2 - Dedicated groundwater pump was obstructing the path of the interface meter probe. Depth measured was based on the elevation of water when pump was removed from the monitoring well (RHMW05).

Measurements recorded by Environmental Science International from January 2014 to August 2015, unless otherwise noted.

Measurements recorded by Element Environmental, LLC from September 2015.

\* - Measurements recorded by NAVFAC HI.

All units in feet (ft).

DTW (TOC) - depth to water from top of well casing

LNAPL - light non-aqueous phase liquid

NT - measurement not taken

SWL - static water level