

**\*\*\*\*\* LIQUID SPILLS - VOLUME CALCULATIONS \*\*\*\*\***

Location of spill: Cedar Canyon WTF

Date of Spill: 6/29/2019

Site Soil Type: Fine Sand

Average Daily Production:            BBL Oil            BBL Water

| <b>Total Area Calculations</b> |              |   |               |   |                       |                |
|--------------------------------|--------------|---|---------------|---|-----------------------|----------------|
| <b>Total Surface Area</b>      | <b>width</b> |   | <b>length</b> |   | <b>wet soil depth</b> | <b>oil (%)</b> |
| Rectangle Area #1              | 47 ft        | X | 147 ft        | X | 1 in                  | 0%             |
| Rectangle Area #2              | 0 ft         | X | 0 ft          | X | 0 in                  | 0%             |
| Rectangle Area #3              | 0 ft         | X | 0 ft          | X | 0 in                  | 0%             |
| Rectangle Area #4              | 0 ft         | X | 0 ft          | X | 0 in                  | 0%             |
| Rectangle Area #5              | 0 ft         | X | 0 ft          | X | 0 in                  | 0%             |
| Rectangle Area #6              | 0 ft         | X | 0 ft          | X | 0 in                  | 0%             |
| Rectangle Area #7              | 0 ft         | X | 0 ft          | X | 0 in                  | 0%             |
| Rectangle Area #8              | 0 ft         | X | 0 ft          | X | 0 in                  | 0%             |

Porosity 0.16 gal per gal

**Saturated Soil Volume Calculations:**

|                            |                      | <b><u>H2O</u></b>  | <b><u>OIL</u></b> |
|----------------------------|----------------------|--------------------|-------------------|
| Area #1                    | 6909 sq. ft.         | 288 cu. ft.        | cu. ft.           |
| Area #2                    | 0 sq. ft.            | cu. ft.            | cu. ft.           |
| Area #3                    | 0 sq. ft.            | cu. ft.            | cu. ft.           |
| Area #4                    | 0 sq. ft.            | cu. ft.            | cu. ft.           |
| Area #5                    | 0 sq. ft.            | cu. ft.            | cu. ft.           |
| Area #6                    | 0 sq. ft.            | cu. ft.            | cu. ft.           |
| Area #7                    | 0 sq. ft.            | cu. ft.            | cu. ft.           |
| Area #8                    | 0 sq. ft.            | cu. ft.            | cu. ft.           |
| Total Solid/Liquid Volume: | <b>6,909 sq. ft.</b> | <b>288 cu. ft.</b> | <b>cu. ft.</b>    |

**Estimated Volumes Spilled**

|                     | <b><u>H2O</u></b> | <b><u>OIL</u></b> |
|---------------------|-------------------|-------------------|
| Liquid in Soil:     | 8.2 BBL           | 0.0 BBL           |
| Liquid Recovered :  | 12.0 BBL          | 0.0 BBL           |
| Spill Liquid        | 20.2 BBL          | 0.0 BBL           |
| Total Spill Liquid: | <b>20.2</b>       |                   |

**Recovered Volumes**

Estimated oil recovered: **0.0 BBL**  
 Estimated water recovered: **12.0 BBL**

| <b><u>Soil Type</u></b> | <b><u>Porosity</u></b> |
|-------------------------|------------------------|
| Clay                    | 0.15                   |
| Peat                    | 0.40                   |
| Glacial Sediments       | 0.13                   |
| Sandy Clay              | 0.12                   |
| Silt                    | 0.16                   |
| Loess                   | 0.25                   |
| Fine Sand               | 0.16                   |
| Medium Sand             | 0.25                   |
| Coarse Sand             | 0.26                   |
| Gravelly Sand           | 0.26                   |
| Fine Gravel             | 0.26                   |
| Medium Gravel           | 0.25                   |
| Coarse Gravel           | 0.18                   |
| Sandstone               | 0.25                   |
| Siltstone               | 0.18                   |
| Shale                   | 0.05                   |
| Limestone               | 0.13                   |
| Basalt                  | 0.19                   |
| Volcanic Tuff           | 0.20                   |
| Standing Liquids        |                        |

NRM1935051494